

411-CD-001-001

EOSDIS Core System Project

ECS System Acceptance Test Procedures - Volume 1 SMC Procedures for the ECS Project

September 1996

Hughes Information Technology Systems
Upper Marlboro Maryland

ECS System Acceptance Test Procedures – Volume 1 SMC Procedures for the ECS Project

September 1996

Prepared Under Contract NAS5-60000
CDRL Item 070

SUBMITTED BY

| | |
|----------------------------------|----------------|
| <u>Mark Settle /s/</u> | <u>8/30/96</u> |
| Mark Settle, ECS Project Manager | Date |
| EOSDIS Core System Project | |

Hughes Information Technology Systems
Upper Marlboro, Maryland

This page intentionally left blank.

Preface

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to acceptance and use. This document is under ECS contractor configuration control. Once this document is approved, Contractor approved changes are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan, and changes to this document shall be made by document change notice (DCN) or by complete revision.

Any questions should be addressed to:

Data Management Office
The ECS Project Office
Hughes Information Technology Systems
1616 McCormick Drive
Upper Marlboro, MD 20774-5372

This page intentionally left blank.

Abstract

The ECS System Acceptance Test procedures documents contain the specific test instructions to completely verify that the TRMM ECS release (ECS Release A) installed at the GSFC, LaRC, and EDC DAACs, and the EOC and SMC sites satisfy the level 3 requirements documented in the Functional and Performance Requirements Specification (F&PRS).

There is a separate set of test procedures for each DAAC, the EOC and SMC. The test procedures are delivered as separate volumes for each site.

These test procedures were developed using the July 31st, 1996, Requirements Traceability Management (RTM) baseline (RELA_TRR_073196).

Keywords: Acceptance test, ECS Release A, level 3 requirements, SMC

This page intentionally left blank.

Change Information Page

| List of Effective Pages | | | |
|-------------------------|-------------------------------|----------------------------|------------|
| Page Number | | Issue | |
| iii through xiv | | Submitted As Final for RRR | |
| 1-1 and 1-2 | | Submitted As Final for RRR | |
| 2-1 and 2-2 | | Submitted As Final for RRR | |
| 3-1 through 3-16 | | Submitted As Final for RRR | |
| 4-1 through 4-8 | | Submitted As Final for RRR | |
| 5-1 through 5-10 | | Submitted As Final for RRR | |
| 6-1 and 6-2 | | Submitted As Final for RRR | |
| 7-1 through 7-24 | | Submitted As Final for RRR | |
| 8-1 through 8-138 | | Submitted As Final for RRR | |
| 9-1 and 9-2 | | Submitted As Final for RRR | |
| 10-1 and 10-2 | | Submitted As Final for RRR | |
| 11-1 and 11-2 | | Submitted As Final for RRR | |
| 12-1 through 12-16 | | Submitted As Final for RRR | |
| A-1 and A-2 | | Submitted As Final for RRR | |
| B-1 through B-4 | | Submitted As Final for RRR | |
| C-1 through C-14 | | Submitted As Final for RRR | |
| D-1 and D-2 | | Submitted As Final for RRR | |
| E-1 through E-4 | | Submitted As Final for RRR | |
| AB- 1 through AB-8 | | Submitted As Final for RRR | |
| GL-1 | | Submitted As Final for RRR | |
| Document History | | | |
| Document Number | Status/Issue | Publication Date | CCR Number |
| 411-CD-001-001 | Submitted As Final for RRR | September 1996 | 96-0995 |

This page intentionally left blank.

Contents

1. Introduction

| | |
|------------------------------|-----|
| 1.1 Identification..... | 1-1 |
| 1.2 Scope..... | 1-1 |
| 1.3 Purpose..... | 1-1 |
| 1.4 Status and Schedule..... | 1-2 |
| 1.5 Organization | 1-2 |

2. Related Documentation

| | |
|---------------------------------|-----|
| 2.1 Parent Documents | 2-1 |
| 2.2 Applicable Documents | 2-1 |
| 2.3 Information Documents | 2-2 |

3. Acceptance Test Overview

| | |
|--|------|
| 3.1 Release A Capabilities | 3-1 |
| 3.2 Release A Acceptance Test Approach | 3-1 |
| 3.2.1 ECS Functional Tests..... | 3-2 |
| 3.2.2 Interface Acceptance Tests..... | 3-2 |
| 3.3 Acceptance Test Roles and Responsibilities | 3-12 |

4. Test Tools

| | |
|---|-----|
| 4.1 Requirements Traceability | 4-2 |
| 4.2 Computer Aided Software Test and Performance Tools..... | 4-3 |
| 4.2.1 XRunner Usage..... | 4-3 |
| 4.2.2 LoadRunner Usage..... | 4-4 |
| 4.2.3 Test Execution Reports..... | 4-4 |

| | |
|---|-----|
| 4.3 Configuration Management Tools | 4-4 |
| 4.3.1 ClearCase..... | 4-4 |
| 4.3.2 Distributed Defect Tracking System (DDTS) | 4-5 |
| 4.4 Network Status and Monitoring | 4-5 |
| 4.4.1 HP OpenView | 4-5 |
| 4.4.2 Network Analyzer/Sniffer | 4-6 |
| 4.4.3 Netperf..... | 4-6 |
| 4.5 External Interface Simulators | 4-6 |
| 4.5.1 TRMM Simulator (TRMMSIM) | 4-6 |
| 4.5.2 EOSDIS Test System (ETS) | 4-6 |
| 4.6 Test Data..... | 4-6 |

5. Test Execution and Coordination

| | |
|---|-----|
| 5.1 Acceptance Test Planning..... | 5-1 |
| 5.2 Acceptance Test Preparation..... | 5-3 |
| 5.2.1 Software Pre-Install..... | 5-3 |
| 5.2.2 Release A Acceptance Test Readiness Reviews | 5-3 |
| 5.2.3 Release A Consent to Ship Review | 5-3 |
| 5.3 Acceptance Test Implementation..... | 5-4 |
| 5.4 Test Execution and Error Handling..... | 5-5 |
| 5.4.1 Non-Conformance Reporting..... | 5-5 |
| 5.4.2 Acceptance Test Delays..... | 5-7 |
| 5.4.3 Discrepancies At Other Sites..... | 5-7 |
| 5.4.4 Physical Configuration Audits..... | 5-7 |
| 5.4.5 Functional Configuration Audit..... | 5-8 |
| 5.4.6 Release Readiness Review (RRR)..... | 5-8 |
| 5.5 Test Logs..... | 5-8 |

6. Release A Test Schedule

| | |
|------------------------|-----|
| 6.1 Test Schedule..... | 6-1 |
|------------------------|-----|

7. Overview

| | |
|--|------|
| 7.1 SMC Release A Functions | 7-1 |
| 7.2 SMC Release A External Interfaces | 7-1 |
| 7.2.1 SMC Facility and Test Environment..... | 7-3 |
| 7.2.2 SMC Test Environment Safety Considerations..... | 7-5 |
| 7.3 SMC Configuration..... | 7-6 |
| 7.3.1 SMC Hardware Configuration | 7-8 |
| 7.3.2 SMC Network Configuration..... | 7-8 |
| 7.3.3 SMC Software Configuration..... | 7-9 |
| 7.4 Acceptance Test Preparation..... | 7-11 |
| 7.4.1 SMC's Site Readiness to Conduct Acceptance Test..... | 7-11 |
| 7.4.2 Required Personnel..... | 7-12 |
| 7.5 Acceptance Test Sequences | 7-13 |
| 7.5.1 SMC Test Procedure Roadmap..... | 7-19 |
| 7.6 Test Conduct..... | 7-19 |
| 7.6.1 Test Direction | 7-19 |
| 7.6.2 Test Schedule Management..... | 7-20 |
| 7.6.3 Test Execution..... | 7-21 |
| 7.6.4 Unscheduled Events During Test Execution..... | 7-21 |
| 7.6.5 Test Conduct Documentation | 7-21 |
| 7.6.6 Daily Test Reviews..... | 7-22 |
| 7.7 Acceptance Test Schedule..... | 7-22 |
| 7.8 Release Readiness Review (RRR)..... | 7-24 |

8. System Management Scenario Group

| | |
|--|------|
| 8.1 ECS Site Commission Scenario..... | 8-1 |
| 8.1.1 M&O Procedures Review and Confidence Test Sequence..... | 8-1 |
| 8.1.2 Site Startup Sequence | 8-5 |
| 8.1.3 Site Operations Sequence | 8-11 |
| 8.1.4 Site Shutdown/Recovery Sequence | 8-14 |
| 8.1.5 Site Maintenance Sequence..... | 8-22 |
| 8.1.6 Site Data/Metadata/Information Management Sequence | 8-22 |
| 8.1.7 Facilities Interfaces Sequence | 8-25 |

| | |
|---|-------|
| 8.2 Scheduling Scenario | 8-33 |
| 8.2.1 Schedule Generation Sequence | 8-34 |
| 8.2.2 Schedule Adjudication Sequence | 8-37 |
| 8.3 ECS Site Upgrade Scenario..... | 8-40 |
| 8.3.1 Enhancements Sequence | 8-40 |
| 8.4 Configuration Management Scenario | 8-45 |
| 8.4.1 Resource Management Sequence | 8-46 |
| 8.4.2 Maintenance Management Sequence..... | 8-49 |
| 8.4.3 Logistics Management Sequence..... | 8-54 |
| 8.4.4 Training Management Sequence..... | 8-58 |
| 8.4.5 Inventory Management Sequence..... | 8-63 |
| 8.4.6 Quality Management Sequence | 8-68 |
| 8.4.7 Policies & Procedures Management Sequence..... | 8-70 |
| 8.4.8 Network Management Sequence..... | 8-79 |
| 8.5 Performance Management Scenario..... | 8-88 |
| 8.5.1 Metrics Sequence..... | 8-89 |
| 8.5.2 Performance Monitoring, Analysis & Testing Sequence | 8-101 |
| 8.6 Ancillary Services Scenario | 8-110 |
| 8.6.1 Fault Management Sequence | 8-110 |
| 8.6.2 Security Management Sequence..... | 8-122 |
| 8.6.3 Accounting and Accountability Sequence..... | 8-127 |
| 8.6.4 Report Generation Sequence..... | 8-130 |

9. Push Scenario Group

10. Pull Scenario Group

11. Flight Operations Scenario Group

12. End-to-End Scenario Group

| | |
|--|------|
| 12.1 Multi-Site Intercommunications and Interoperations Scenario | 12-1 |
| 12.1.1 Inter-Site Message Sequence | 12-1 |
| 12.1.2 Multi-Site System Management Sequence..... | 12-4 |

| | |
|---|-------|
| 12.2 TRMM Mission Support Scenario..... | 12-11 |
| 12.3 AM-1 End-to-End Scenario | 12-11 |
| 12.4 Science Data Access an Interoperability Scenario..... | 12-11 |
| 12.5 System Performance Scenario..... | 12-11 |
| 12.5.1 Data Ingest, Data Server and Data Distribution Performance Sequence..... | 12-12 |
| 12.5.2 System Response Time Performance Sequence..... | 12-12 |
| 12.5.3 ECS Evolution, and Growth Sequence | 12-12 |
| 12.5.4 ECS Testability and Overall Capabilities Sequence..... | 12-14 |

Figures

| | |
|---|------|
| 3-1. ECS Release A Interfaces with the EOS Ground System..... | 3-3 |
| 3-2. Release A Key Interfaces Between GSFC and LaRC..... | 3-11 |
| 3-3. Release A Landsat-7 and AM-1 Key Interfaces | 3-12 |
| 4-1. Release A Test Tool Integration..... | 4-2 |
| 4-2. RTM Classes | 4-2 |
| 5-1. Release A Acceptance Test Life Cycle..... | 5-2 |
| 5-2. Acceptance Test NCR Process | 5-6 |
| 5-3. NRCA System Sample Reports | 5-6 |
| 5-4. Test Log Summary..... | 5-9 |
| 6-1. Release A Detail Test Activity Schedule..... | 6-2 |
| 7-1. SMC External Interfaces | 7-2 |
| 7-2. Location of the SMC at GSFC | 7-4 |
| 7-3. SMC Hardware Configuration | 7-8 |
| 7-4. SMC Network Architecture..... | 7-9 |
| 7-5. Communications and System Management Subsystems..... | 7-10 |
| 7-6. ACCEPTANCE TEST SCHEDULE | 7-23 |
| 7-7. Release Readiness Review Material..... | 7-24 |

Tables

| | | |
|------|---|------|
| 3-1. | ECS Ir1 to Release A Enhancements..... | 3-1 |
| 3-2. | ECS Release A Data Flow Interfaces..... | 3-4 |
| 4-1. | Release A Test Tool Descriptions..... | 4-1 |
| 4.2. | RTM Class Definitions..... | 4-3 |
| 4-3. | Release A Data Sources, Destination, and Data Content | 4-7 |
| 5-1. | Discrepancy Classification and Priority | 5-7 |
| 7-1. | SMC Operations Support Functions | 7-1 |
| 7-2. | SMC ECS Release A Data Flow Interfaces | 7-3 |
| 7-3. | Release A SMC Release A System Configuration..... | 7-7 |
| 7-4. | Planned Sequence of Test Activities..... | 7-14 |
| 8-1. | RMA Capabilities..... | 8-97 |

Appendix A. Test Sequences Mapped to External Interfaces

Appendix B. Test Sequences Mapped to Operations Scenarios

Appendix C. Test Procedures Mapped to M&O Operations Manual

Appendix D. Test Sequences Mapped to GSFC Hardware

Appendix E. Test Procedure Format

Abbreviations and Acronyms

Glossary

1. Introduction

1.1 Identification

The Acceptance Test Procedures (ATPr), Contract Data Requirement List (CDRL) item 070, whose requirements are specified in Data Item Description (DID) 411/VE1, is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Contract NAS5-60000.

The Release A ECS System Acceptance Test Procedures describe the approach the Independent Acceptance Test Organization (IATO) takes to verify level 3 ECS requirements. The Release A ECS System Acceptance Test Procedures - Volumes 1-5 contain the step by step test procedures for each Release A site.

1.2 Scope

Release A of ECS supports the early operational stages of the Tropical Rainfall Measuring Mission (TRMM). Release A follows an earlier ECS delivery, referred to as Interim Release 1 (Ir1), which provided certain enterprise infrastructure in preparation for subsequent deliveries. Ir1 also provided science software integration and testing capabilities. The infrastructure delivery of ECS involves three Distributed Active Archive Centers (DAACs)-- these being the Goddard Space Flight Center (GSFC), the Langley Research Center (LaRC) and the EROS Data Center (EDC). Even though only two of the DAACs (GSFC and LaRC) directly support the TRMM effort, all three are updated at Release A. This simplifies configuration management and allows for interface testing for future ECS releases. For Release A, the Ir1 configurations of GSFC and LaRC DAACs are upgraded with major hardware and software deliveries. The EDC, which is not part of TRMM operations, receives a minor upgrade for Release A to support interface testing. Additionally, Release A provides for overall ECS system monitoring at the System Monitoring and Coordination Center (SMC) and core flight operations functionality at the EOS Operation Center (EOC) for EOS spacecraft.

This document comprises the IATO's test procedures for Release A. It contains the step-by-step procedures for implementing each formal acceptance test, including the detailed procedures for data reduction and analysis of the test results.

1.3 Purpose

The purpose of the Release A ECS System Acceptance Test Procedures is to define the procedures used to formally verify that the ECS Release A meets all specified level 3, operational, functional, performance and interface requirements. These procedures define the specific objectives, event sequences, support requirements, configuration identification, and testing procedures for each acceptance test or series of test to be performed during acceptance testing of the ECS.

1.4 Status and Schedule

The submittal of DID 411/VE1 meets the milestone specified in the Contract Data Requirements List (CDRL) for ECS Overall System Acceptance Test Procedures of NASA contract NAS5-60000. The submittal schedule is three months prior to the ECS Release A Release Readiness Review (RRR).

1.5 Organization

This document is organized in five volumes. The Release A ECS System Acceptance Test Procedures - Volumes 1 through 5 contains the step-by-step test procedures at each site.

The Release A ECS System Acceptance Test Procedures - Volumes 1-5 where-in the detailed procedures for each individual site are detailed. Sections 7-12 of Volumes 1-5 map directly to the material introduced in corresponding sections of the Release A ATPr's listed below.

- Section 1: Introduction- Provides information regarding the identification, scope, purpose, status and schedule, and organization of this document.
- Section 2: Related Documents: Provides a listing of parent documents, applicable documents, and documents which are used as source information.
- Section 3: Acceptance Test Overview- Describes Release A capabilities and provides an overview of the acceptance functional and interface tests. Acceptance test roles and responsibilities are also described.
- Section 4: Test Tools- Describes the test tools used by IATO to conduct ECS Release A System Acceptance Tests.
- Section 5: Test Execution and Coordination-Discusses the process by which formal acceptance testing is managed on a daily basis.
- Section 6: Release A Test Schedule- Depicts the overall ECS acceptance test schedule and coordination activities.

Sections 1-6 of Volumes 1-5 describes the approach that the IATO takes to Test ECS.

- Section 7: Test Site Environment- Provides an overview of the individual site test environment.
- Section 8: System Management Scenario Group- Contains the detailed procedures for the system management group of requirements.
- Section 9: Push Scenario Group- Contains the detailed procedures for the push scenario group of requirements.
- Section 10: Pull Scenario Group- Contains the detailed procedures for the pull scenario group of requirements.
- Section 11: Flight Operations Scenario Group- Contains the detailed procedures for the Flight Operations scenario group of requirements.
- Section 12: End-to-End Scenario Group- Contains the detailed procedures for the end-to-end scenario group of requirements.

2. Related Documentation

2.1 Parent Documents

The parent documents are the documents from which the scope and content of this document are derived.

| | |
|-----------------|--|
| 194-401-VE1-002 | Verification Plan for the ECS Project, Final |
| 409-CD-001-004 | ECS Overall System Acceptance Test Plan for Release A |
| 420-05-03 | Earth Observing System (EOS) Performance Assurance Requirements for EOSDIS Core System (ECS) |
| 423-41-01 | Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work |
| 423-41-02 | Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) |

2.2 Applicable Documents

The following documents are referenced within this Test Procedures document, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document.

| | |
|----------------|--|
| 107-CD-002-XXX | Level 1 Master Schedule for the ECS Project (published monthly) |
| 505-41-11 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and the Version 0 System, 10/95 |
| 505-41-12 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and Science Computing Facilities, 5/95 |
| 505-41-14 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and Tropical Rainfall Measuring Mission (TRMM) Ground System, 2/95 |
| 505-41-15 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS the AM project for AM-1 Flight Operations, 7/95 |
| 505-41-17 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI), 10/95 |

| | |
|--------------------|---|
| 505-41-18 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS and MITI ASTER GDS Project, 7/95 |
| 505-41-19 | Goddard Space Flight Center, Interface Requirements Document Between the EOSDIS Core System (ECS) and the National Oceanic and Atmospheric Administration (NOAA) Affiliated Data Center (ADC), 5/95 |
| 505-41-21 | Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and NASA Institutional Support Systems (NISS), 5/95 |
| 505-41-32 | Goddard Space Flight Center, Interface Requirements Document Between Earth Observing System Data and Information System, and the Landsat 7 System, 7/95 |
| 560-EDOS-0211.0001 | Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS), and the EOS Ground System (EGS) Elements |

2.3 Information Documents

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document, but are not binding on the content of this ECS System Acceptance Test Procedures document.

| | |
|----------------|--|
| 222-TP-003-008 | Release Plan Content Description for the ECS Project |
|----------------|--|

3. Acceptance Test Overview

The Earth Observing System (EOS) Data Information System (EOSDIS) Core System (ECS) capabilities are developed in terms of four formal releases. The first of the four formal releases include capabilities necessary to fully support the scheduled launch and ongoing operations for Tropical Rainfall Measurement Mission (TRMM), interface testing for Landsat-7, and command and control interface testing for AM-1. This first release, called Release A, supports data operations that follow at the EOS Operations Center (EOC), System Management Center (SMC) and three Distributed Active Archive Centers (DAACs). The DAACs that are activated for Release A are located at Goddard Space Flight Center (GSFC), Langley Research Center (LaRC), and the EROS Data Center (EDC).

3.1 Release A Capabilities

Release A of ECS supports the early operational stages of the Tropical Rainfall Measuring Mission (TRMM). Release A follows an earlier ECS delivery, referred to as Interim Release 1 (Ir1), which provided certain enterprise infrastructure in preparation for down stream deliveries. Ir1 also provided science software integration and testing capabilities. For Release A, the Ir1 configurations of GSFC, and LaRC are updated with major hardware and software deliveries while EDC, which is not part of TRMM operations, receives a minor update to support interface testing. Release A provides initial capabilities at the EOC and SMC, which include support to early interface testing and core FOS functionality. Table 3-1 summarizes the Ir1 capabilities and Release A enhancements.

Table 3-1. ECS Ir1 to Release A Enhancements

| SITE | Release Ir1 Capabilities | New Release A Capabilities Deployed at Each Site |
|------|--|--|
| SMC | System Performance Monitoring | System Performance Monitoring and Analysis; WAN Management; and System Coordination |
| GSFC | TRMM Mission Support; VIRS Data Ingest, Ingest, Ancillary Data | TRMM Mission Support; VIRS Data Ingest, Archive & Distribution ; Ingest Ancillary Data; AM-1 Interface Testing; AM-1 MODIS Science Software I&T; VO Data Migration & Interoperability; TOMS Ozone Data Ingest and Archive; and System Resource Management |
| LaRC | TRMM Mission Support; TRMM CERES Data Ingest; NOAA Ancillary Data Ingest | TRMM Mission Support; TRMM CERES Data Ingest, Production, Archive & Distribution; Data Migration & Interoperability; AM-1 Interface Testing; NOAA Ancillary Data Ingest; TRMM & AM-1 CERES, and MISR and MOPITT Science Software I&T; SAGE Aerosol & Ozone Data, and ISCCP Data Ingest and Archive; and System Resource Management |
| EDC | Landsat-7 Interface Testing; Landsat-7 Level-OR Data Ingest | Landsat-7 Interface Testing; Landsat-7 Level-OR Data Ingest; ASTER/MODIS Science Software I&T; Ingest and Storage of Landsat-7 LOR data; and System Resource Management |
| EOC | | AM-1 Interface Testing; ASTER GDS, SCF, NCC, EDOS, and FDF Interface Testing; core FOS functionality, and System Resource Management |

3.2 Release A Acceptance Test Approach

The acceptance testing of Release A capabilities is divided into five major scenario groups: System Management, Push, Pull, Flight Operations, and End-to-End. These scenario groups identify high

level ECS functionality from a users and operations viewpoint. Each group is sub-divided into scenarios that emulate the operations and user environment. Scenarios are further broken down into more manageable test sequences in which test procedures that trace to level 3 requirements are executed. The Requirements and Traceability Management (RTM) Tool is used for the purpose of tracking level 3 requirements' test status.

3.2.1 ECS Functional Tests

The complete set of ECS functions allocated to Release A are verified to ensure that the release meets those requirements needed to support TRMM and provide core functionality for the AM-1 missions. This includes verifying requirements for all features needed to support the ECS Release objectives for spacecraft operations and control, scheduling, data operations, information management and archive, science processing, networks, and system management.

Acceptance testing include the verification of certain ECS features needed to support TRMM. These features are: the ingest, archive processing, and distribution of Level-1 through Level-3 of Precipitation Radar (PR), TRMM Microwave Imager (TMI), and Visible Infrared Scanner (VIRS) instrument data; and TRMM Ground Validation (GV) data transmitted from the TSDIS, which is a production system provided by the TRMM project. Additional features include the ingest, archive, product generation, and distribution of TRMM CERES and LIS instrument data received from the SDPF.

3.2.2 Interface Acceptance Tests

Acceptance testing verifies system compliance to level 3 requirements by focusing on the objectives and capabilities specified for Release A. These capabilities are tested for functionality and performance within the boundaries of the interfaces defined for the release. The external boundary of ECS is typically at communications, data medium or graphic interfaces. For communications, these interfaces act as conduits through which input (Level-0) and output data (Level-1, Level-2, etc.), and stimuli (commands, requests, etc.) and responses (acknowledgments, data, etc.) flow. The communications interfaces to be verified for Release A include National Aeronautics and Space Administration (NASA) Science Internet (NSI), NASA Communications (NASCOM) Operational Local Area Network (NOLAN), and EOSDIS Backbone network (EBnet) where they terminate at the applicable ECS sites. At the ECS, these interfaces are physically located at the SMC and EOC; and the ECS GSFC, LaRC and EDC DAAC sites. The communications networks that are connected to the ECS terminate at two classes of external systems: data providers (whose science data are later referred to as push data) and data users (whose requests result in what later are referred to as pull data). The data providers for Release A are the Sensor Data Processing Facility (SDPF), ECS Data and Operation System (EDOS), Flight Dynamics Facility (FDF), Network Communications Center (NCC), the Landsat Processing System (LPS), and the TRMM Science Data and Information System (TSDIS). The data users for TRMM are the science user community at the DAACs and the SCFs. The node chart in Figure 3-1 depicts the interconnection of external systems with ECS. A summary of the content and carriers associated with the data flowing across ECS interfaces is shown in Table 3-2. A more complete account of each interface may be found in Interface Control Documents 209/SE1-001 through 020.

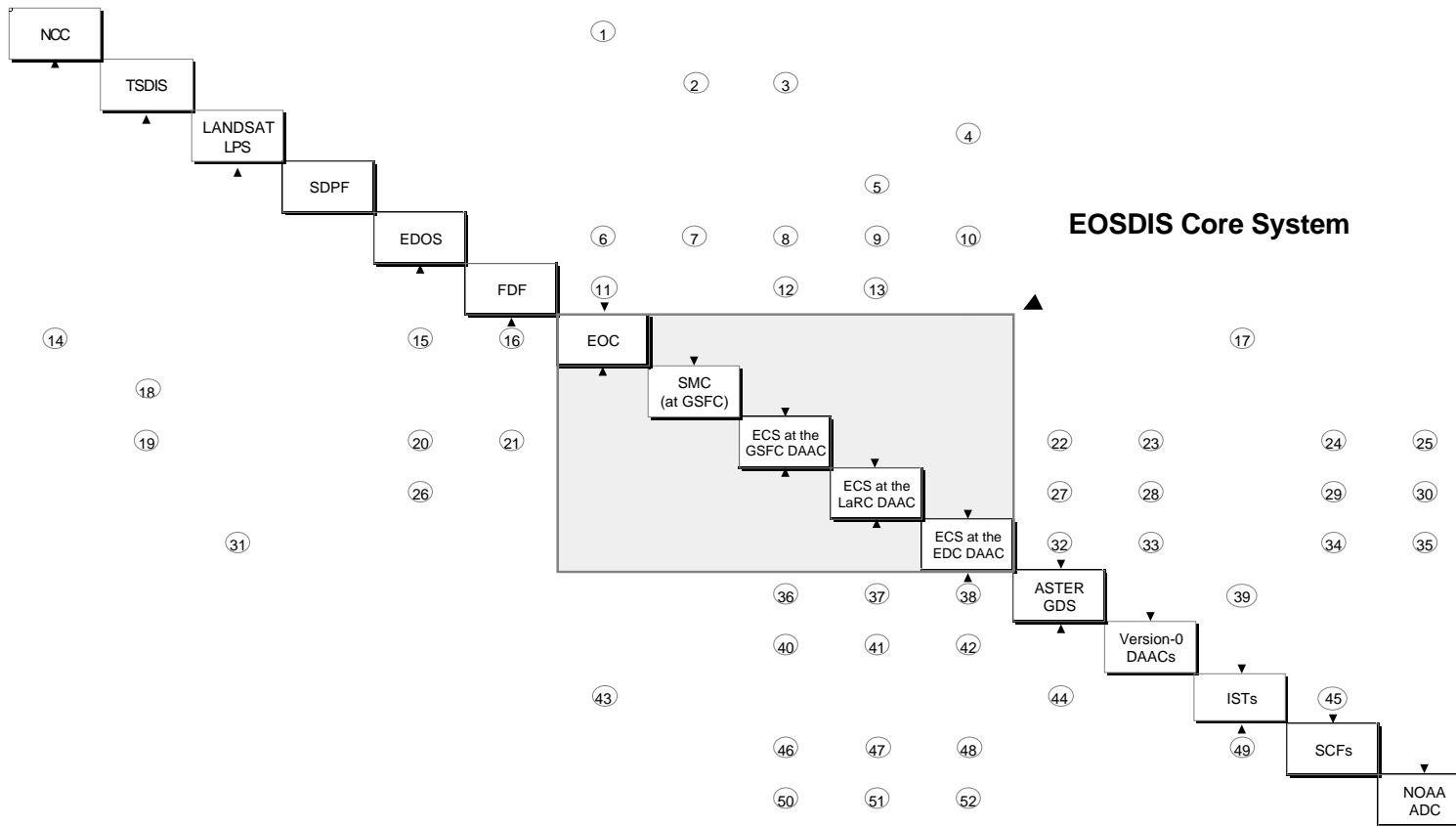


Figure 3-1. ECS Release A Interfaces with the EOS Ground System

Table 3-2. ECS Release A Data Flow Interfaces (1 of 7)

| Node | Mission | Source | Destination | Carrier/ Media | Data Content | Source | Date |
|------|-----------|-------------|----------------------|-------------------|---|--|--------------------------------|
| 1 | AM-1 | NCC | EOC | EBnet | GCM status and disposition messages. | 305-CD-040-001 530-ICD-NCCDS/ MOC, Annex 4 329-CD-001-003 | Oct-95 Sep-95 Oct-95 |
| 2 | TRMM | TSDIS | SMC at GSFC | Email/ Phone | Schedule Coordination & Adjudication for Data Exchange with DAACs; and Status Information. | 209-CD-007-001 Section 4 | Jan-95 |
| 3 | TRMM | TSDIS | ECS at the GSFC DAAC | Exchange LAN | Levels 1A to 3 TMI, PR, GV, VIRS and Combined Data Products, Browse Products, and Metadata; Updated Metadata; TMI, PR, GV, VIRS, Combined Algorithms and Documentation; Reprocessing Product Schedules, and Delayed Product Status; Request for Ancillary Data. | 209-CD-007-004 Figure 5-1 | May-96 |
| 4 | Landsat-7 | Landsat LPS | ECS at the EDC DAAC | Landsat Network | Data Availability Notice; Level 0R Data; Level 0R Inventory Metadata; Level 0R Browse. | 209-CD-013-003 Table 3-1 | Mar-96 |
| 5 | TRMM | SDPF | ECS at the LaRC DAAC | EBnet | Quicklook Data Product; Level-0 Data Products; Ephemeris Data File. | 510-203.103 Table 10-3 | Apr-96 |
| 6 | AM-1 | EDOS | EOC | EBnet | Spacecraft and instrument real time housekeeping and health and safety telemetry; Real-time and rate-buffered. | 510-ICD-EDOS Table 4.2.2-1 307-CD-001-003 329-CD-001-003 | Jan-96 Oct-95 Oct-95 |
| 7 | AM-1 | EDOS | SMC at GSFC | EBnet | Summary Performance Report. | 510-ICD-EDOS/EGS | Jan-96 |
| 8 | AM-1 | EDOS | ECS at the GSFC DAAC | EBnet | Service Request Disposition; PDSs (Level-0 data); ADSs (Back-up Level-0 Data); PDS and ADS Delivery Records; Physical Media Unit Delivery Record; Undetected Fault Isolation. | 305-CD-014-001 Table 3.2-1 | Jul-95 |
| 9 | AM-1 | EDOS | ECS at the LaRC DAAC | EBnet | Service Request Disposition; PDSs (Level-0 data); PDS Delivery Record; Undetected Fault Isolation. | 305-CD-015-001 Table 3.2-1 | Jul-95 |
| 10 | AM-1 | EDOS | ECS at the EDC DAAC | EBnet | Level-0; Quick Look, Status; and Coordination Data. | 222-TP-003-005 Section 5 | Dec-94 |
| 11 | AM-1 | FDF | EOC | EBnet | Basic connectivity test messages. | 307-CD-001-003 329-CD-001-003 | Oct-95 Oct 95 |
| 12 | AM-1 | FDF | ECS at the GSFC DAAC | NOLAN | Repaired Orbit Data. | 305-CD-014-001 Table 3.2-1 | Jul-95 |

Table 3-2. ECS Release A Data Flow Interfaces (2 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|--------------|----------------------|----------------------|---------------|---|--|----------------------------|
| 13 | AM-1 | FDF | ECS at the LaRC DAAC | NOLAN | Refined Orbit/Attitude data. | 305-CD-015-001 Table 3.2-1 | Jul-95 |
| 14 | AM-1 | EOC | NCC | EBnet | Ground Configuration Message Requests. | 305-CD-040-001 530-ICD-NCCDS/ MOC, Annex 4 329-CD-001-003 | Oct-95 Sep-95 Oct-95 |
| 15 | AM-1 | EOC | EDOS | EBnet | Spacecraft and instrument commands. | 510-ICD-EDOS Table 4.2.2-1 307-CD-001-003 329-CD-001-003 | Jan-96 Oct-95 Oct-95 |
| 16 | AM-1 | EOC | FDF | EBnet | Basic connectivity test messages. | 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 |
| 17 | AM-1 | EOC | ISTs | NSI | Spacecraft and instrument telemetry. | 305-CD-040-001 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 Oct-95 |
| 18 | TRMM | SMC at GSFC | TSDIS | Email/Phone | Schedule Coordination & Adjudication for Data Exchange with DAACs; and Status Information. | 209-CD-007-001 Section 4 | Jan-95 |
| 19 | TRMM | ECS at the GSFC DAAC | TSDIS | Exchange LAN | Levels 1A to 3 TMI, PR, GV, VIRS, and Combined Data Products for Reprocessing; Ancillary Data for Processing and Reprocessing; TRMM Orbit Ephemeris; TRMM Level-0 Housekeeping data. | 209-CD-007-004 Figure 5-1 | May-96 |
| 20 | AM-1 | ECS at the GSFC DAAC | EDOS | EBnet | Service Requests (Back-up data requests); Fault report; Fault Isolation Request; Level-0 data. | 305-CD-014-001 Table 3.2-1 | Jul-95 |
| 21 | AM-1 | ECS at the GSFC DAAC | FDF | NOLAN | Repaired/Retained Orbit Data Request. | 305-CD-014-001 Table 3.2-1 | Jul-95 |
| 22 | AM-1 | ECS at the GSFC DAAC | ASTER GDS | NSI | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 23 | All Missions | ECS at the GSFC DAAC | Version-0 DAACs | EBnet | Directory Search Requests; Inventory Search Requests; Acknowledgments; Browse Request; Product Request; Statistics; Quit; Pong. | 209-CD-011-004 Figure 4-2 | Mar-96 |

Table 3-2. ECS Release A Data Flow Interfaces (3 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|--------------|----------------------|-----------------|---------------|--|-----------------------------|--------|
| 24 | AM-1 | ECS at the GSFC DAAC | SCFs | NSI | ECS Software Package; I & T Requirements; Science Software Integration Test Status; Data Availability notices; Operational Science Data Production Software Package; Test Product Availability Message during Software I & T; QA Notification Specification Acknowledgement; Data Quality Request Notification; Data Delivered for QA; Processing Status; Resource usage; Reprocessing Request Acknowledgement; Product history. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |
| 25 | AM-1 | ECS at the GSFC DAAC | NOAA ADC | NSI | Inventory Search; Browse Request; Product Request; Guide Search. | 209-CD-006-005 Figure 5-1 | Mar-96 |
| 26 | AM-1 | ECS at the LaRC DAAC | EDOS | Ebnet | Fault report; Fault Isolation Request; Level-0 data. | 305-CD-015-001 Table 3.2-1 | Jul-95 |
| 27 | AM-1 | ECS at the LaRC DAAC | ASTER GDS | NSI | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 28 | All Missions | ECS at the LaRC DAAC | Version-0 DAACs | EBnet | Directory Search Requests; Inventory Search Requests; Acknowledgments; Browse Request; Product Request; Statistics; Quit; Pong. | 209-CD-011-004 Figure 4-2 | Mar-96 |

Table 3-2. ECS Release A Data Flow Interfaces (4 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|--------------|----------------------|-----------------|-----------------|--|-----------------------------|--------|
| 29 | AM-1 | ECS at the LaRC DAAC | SCFs | NSI | ECS Software Package; I & T Requirements; Science Software Integration Test Status; Data Availability notices; Operational Science Data Production Software Package; Test Product Availability Message during Software I & T; QA Notification Specification Acknowledgement; Data Quality Request Notification; Data Delivered for QA; Processing Status; Resource usage; Reprocessing Request Acknowledgement; Product history. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |
| 30 | AM-1 | ECS at the LaRC DAAC | NOAA ADC | NSI | Inventory Search; Browse Request; Product Request; Guide Search. | 209-CD-006-005 Figure 5-1 | Mar-96 |
| 31 | Landsat-7 | ECS at the EDC DAAC | Landsat LPS | Landsat Network | Data Transfer Acknowledgment. | 209-CD-013-003 Table 3-1 | Mar-96 |
| 32 | AM-1 | ECS at the EDC DAAC | ASTER GDS | NSI | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 33 | All Missions | ECS at the EDC DAAC | Version-0 DAACs | EBnet | Directory Search Requests; Inventory Search Requests; Acknowledgments; Browse Request; Product Request; Statistics; Quit; Pong. | 209-CD-011-004 Figure 4-2 | Mar-96 |

Table 3-2. ECS Release A Data Flow Interfaces (5 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|---------|---------------------|----------------------|---------------|--|--|----------------------------|
| 34 | AM-1 | ECS at the EDC DAAC | SCFs | NSI | ECS Software Package; I & T Requirements; Science Software Integration Test Status; Data Availability notices; Operational Science Data Production Software Package; Test Product Availability Message during Software I & T; QA Notification Specification Acknowledgement; Data Quality Request Notification; Data Delivered for QA; Processing Status; Resource usage; Reprocessing Request Acknowledgement; Product history. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |
| 35 | AM-1 | ECS at the EDC DAAC | NOAA ADC | NSI | Inventory Search; Browse Request; Product Request; Guide Search. | 209-CD-006-005 Figure 5-1 | Mar-96 |
| 36 | AM-1 | ASTER GDS | ECS at the GSFC DAAC | NSI | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 37 | AM-1 | ASTER GDS | ECS at the LaRC DAAC | NSI | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 38 | AM-1 | ASTER GDS | ECS at the EDC DAAC | Tape | Algorithms, Source Code, Documentation, SCF Interaction; Level 1 Data Products; Product Requests; Data Products; Status; System and Network Management; User Authentication, User Data Search & Request, User Product Requests, Status. | 209-CD-002-003 Figure 3-1 | Mar-96 |
| 39 | AM-1 | ASTER GDS | ISTs (ASTER only) | ASTER LAN | One-day schedule; Short-term schedule. | 209-CD-002-003 307-CD-001-003 329-CD-001-003 | Mar-96 Oct-95 Oct-95 |

Table 3-2. ECS Release A Data Flow Interfaces (6 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|--------------|-------------------|----------------------|--------------------------|--|--|----------------------------|
| 40 | All Missions | Version-0 DAACs | ECS at the GSFC DAAC | Ebnet | Directory Search Results; Inventory Search Results; ftp and Integrated Browse Results; Product Results; Quit; Pong; NCEP Ancillary data. | 209-CD-011-004 Figure 4-2 | Mar-96 |
| 41 | All Missions | Version-0 DAACs | ECS at the LaRC DAAC | EBnet | Directory Search Results; Inventory Search Results; ftp and Integrated Browse Results; Product Results; Quit; Pong. | 209-CD-011-004 Figure 4-2 | Mar-96 |
| 42 | All Missions | Version-0 DAACs | ECS at the EDC DAAC | EBnet | Directory Search Results; Inventory Search Results; ftp and Integrated Browse Results; Product Results; Quit; Pong. | 209-CD-011-004 Figure 4-2 | Mar-96 |
| 43 | AM-1 | ISTs | EOC | NSI, EBnet for ASTER IST | Instrument planning, Instrument Microprocessor Memory Loads. | 305-CD-040-001 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 Oct-95 |
| 44 | AM-1 | ISTs (ASTER only) | ASTER GDS | ASTER LAN | Basic connectivity test messages. | 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 |
| 45 | AM-1 | ISTs | SCFs | Site Campus Networks | Instrument Analysis Results. | 305-CD-040-001 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 Oct-95 |
| 46 | AM-1 | SCFs | ECS at the GSFC DAAC | NSI | Algorithms; Remote Access Session Dialog; Request for Operational Data Production Software Package; Request for Test Products after Software Integration and Test; Test Product Reviews; QA Notification Specification; QA Metadata Updates; Request for Processing Status; Request for Resource Usage; Reprocessing Requests. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |
| 47 | AM-1 | SCFs | ECS at the LaRC DAAC | NSI | Algorithms; Remote Access Session Dialog; Request for Operational Data Production Software Package; Request for Test Products after Software Integration and Test; Test Product Reviews; QA Notification Specification; QA Metadata Updates; Request for Processing Status; Request for Resource Usage; Reprocessing Requests. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |

Table 3-2. ECS Release A Data Flow Interfaces (7 of 7)

| Node | Mission | Source | Destination | Carrier/Media | Data Content | Source | Date |
|------|---------|----------|----------------------|----------------------|--|--|----------------------------|
| 48 | AM-1 | SCFs | ECS at the EDC DAAC | NSI | Algorithms; Remote Access Session Dialog; Request for Operational Data Production Software Package; Request for Test Products after Software Integration and Test; Test Product Reviews; QA Notification Specification; QA Metadata Updates; Request for Processing Status; Request for Resource Usage; Reprocessing Requests. | 209-CD-005-005 Figure 3.1-1 | Mar-96 |
| 49 | AM-1 | SCFs | ISTs | Site Campus Networks | Instrument Microprocessor Memory Loads. | 305-CD-040-001 307-CD-001-003 329-CD-001-003 | Oct-95 Oct-95 Oct-95 |
| 50 | AM-1 | NOAA ADC | ECS at the GSFC DAAC | NSI | Advertising Information; Dependent Valid Update; Inventory Search Result; Integrated Browse Result; FTP Browse Result; Product Result Message; Guide Result; NCEP Ancillary data. | 209-CD-006-005 Figure 5-1 | Mar-96 |
| 51 | AM-1 | NOAA ADC | ECS at the LaRC DAAC | NSI | Advertising Information; Dependent Valid Update; Inventory Search Result; Integrated Browse Result; FTP Browse Result; Product Result Message; Guide Result. | 209-CD-006-005 Figure 5-1 | Mar-96 |
| 52 | AM-1 | NOAA ADC | ECS at the EDC DAAC | NSI | Advertising Information; Dependent Valid Update; Inventory Search Result; Integrated Browse Result; FTP Browse Result; Product Result Message; Guide Result. | 209-CD-006-005 Figure 5-1 | Mar-96 |

The capability of the ECS to communicate and transfer data over the external interfaces in accordance with the F&PRS and applicable IRDs are verified during acceptance tests. Data content flowing across Release A interfaces include TRMM data from SDPF and simulated AM-1 data from EDOS; ancillary data from NOAA and FDF; schedule data to/from SDPF, ground configuration messages to/from NCC, Level-1 through Level-3 TRMM data from TSDIS; Landsat-7 Level-0, metadata and browse data from the Landsat LPS; and selected Level-0 through Level-4 to the SCFs. The context chart in Figure 3-2 graphically depicts Release A key interfaces between GSFC and LaRC. The context chart in Figure 3-3 graphically depicts the Release A

Landsat-7 and AM-1 key interfaces. The capability of the ECS to provide TRMM pre-launch ground system end-to-end test support, and AM-1 and Landsat-7 interface testing support are verified in acceptance tests for Release A. Tests to verify two-way inter-operability with the Version-0 system and migration and/or access of Version 0 data archives are also conducted as well as one-way inter-operability with NOAA.

Command and control interfaces to support AM-1 early interface testing are conducted. These tests include EOC planning, scheduling, command, control and monitoring of the AM-1 spacecraft; and CSMS system management and communications infrastructure.

The interfaces needed to support early Landsat-7 interface testing are also verified. These interfaces are those needed for: the receipt and storage of Landsat-7 level-0R data (viewable image data with radiometric and geometric information appended but not applied) at the EDC DAAC and the receipt and storage of Landsat-7 metadata and browse data at the EDC DAAC.

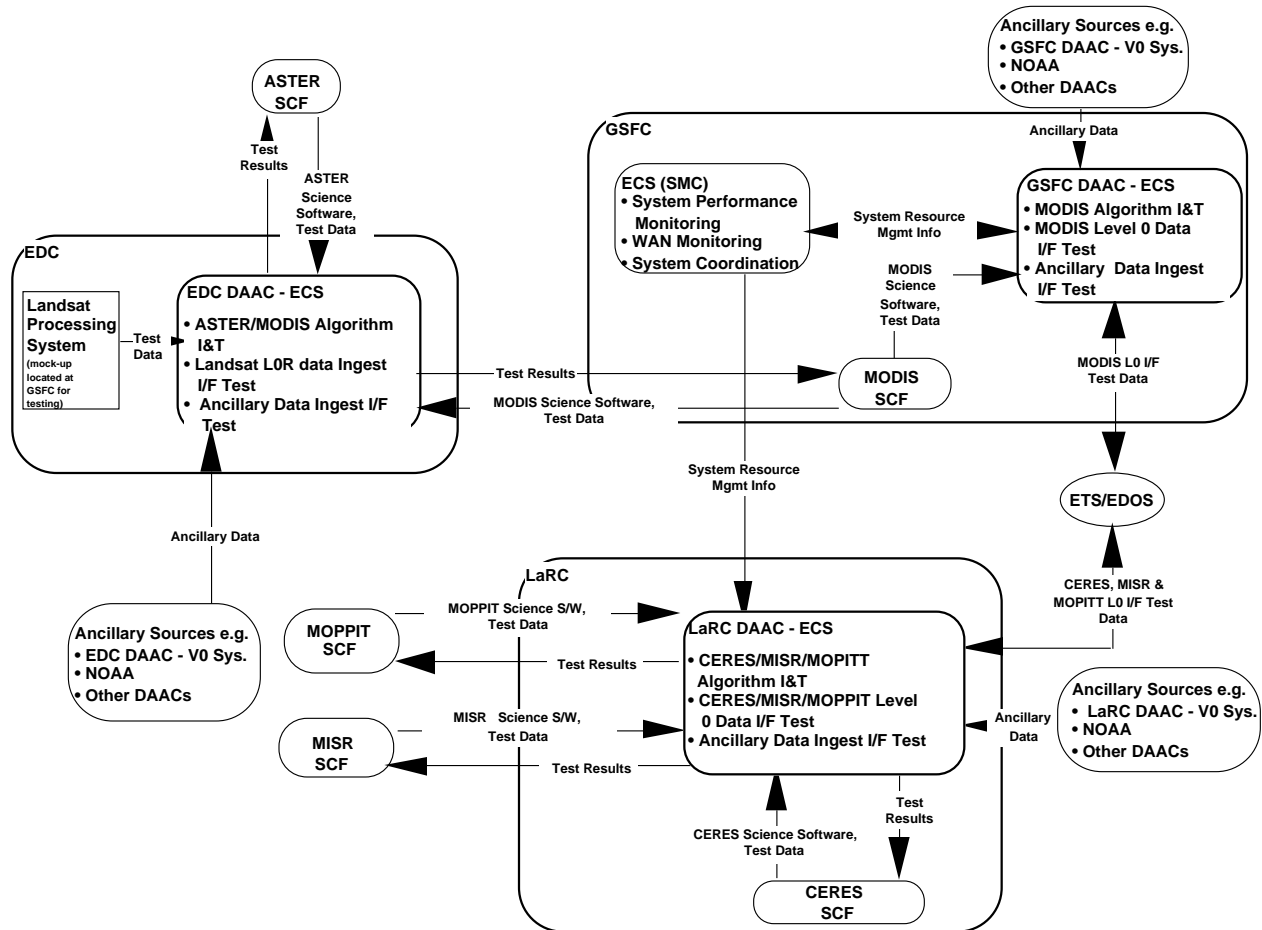


Figure 3-2. Release A Key Interfaces Between GSFC and LaRC

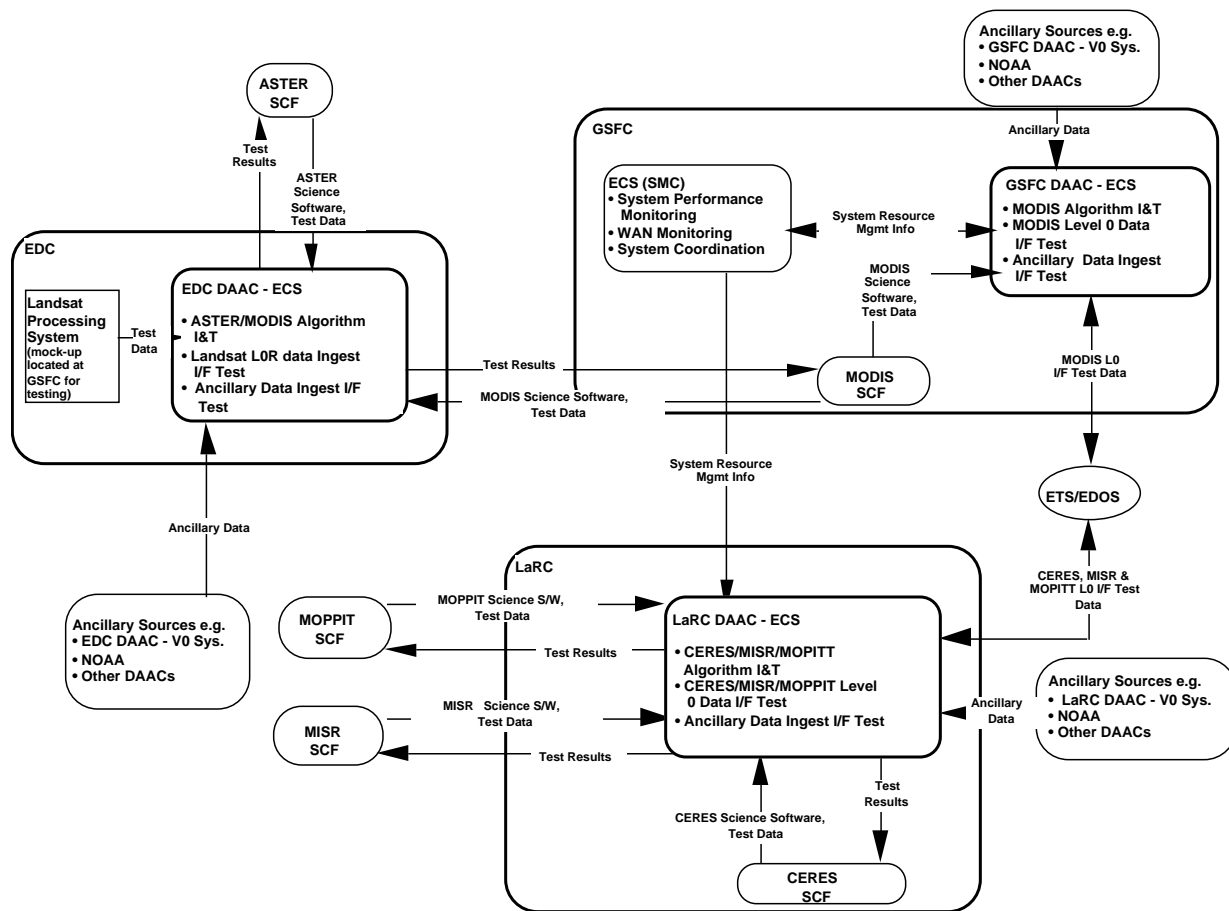


Figure 3-3. Release A Landsat-7 and AM-1 Key Interfaces

3.3 Acceptance Test Roles and Responsibilities

Acceptance testing is a formal process that requires the coordination of different organizations. Each organization has well defined roles and responsibilities for the acceptance testing process:

Independent Acceptance Test Organization (IATO): The IATO assigns a test manager to coordinate and run acceptance testing. The IATO also provides test conductors to execute the step-by-step procedures that are defined in the ATPr. Test conductors also write, collect, and track nonconformance reports and determine the impact of these reports on test plans, scenarios, test cases, and procedures.

Quality Office (QO): The QO provides a representative to witness the execution of acceptance testing. The QO also tracks the status of nonconformance reports and reviews them prior to closure to ensure that the required actions have been completed.

Configuration and Data Management Organization: The Configuration Management Office (CMO) coordinates with the IATO to capture the test configuration of software, hardware, test data, test tools, and documentation prior to test execution to ensure repeatability. They also capture and retain test outputs (e.g., test logs, data, and modified procedures) and distribute copies for test analysis. The product baseline, which is established prior to the RRR and includes test reports, is maintained by the CMO.

ECS Maintenance & Operations (M&O) Organization: As part of acceptance testing at the test site, the site manager assigns M&O personnel who are integrated into the test team to help execute acceptance tests. The early first-hand involvement of the site manager and his operations personnel in site acceptance testing provides the M&O Team with early visibility into each new release and hastens a smooth transition. This involvement and familiarity with ECS software in the stages before release to the user base greatly enhance the effectiveness and productivity of the M&O staff and positions a highly competent and responsive user support staff on-site at the DAACs. In addition, during the M&O phase, the IATO assists by providing benchmark tests to verify operational performance of the ECS system. The IATO provides guidance in acceptance testing during the verification of approved changes and enhancements.

ESDIS SI&T Contractor: The ESDIS Integration Contractor and the Independent Verification and Validation (IV&V) Contractor witness and monitors acceptance testing, as directed by the ESDIS SI&T, and the IV&V Contractor.

The Acceptance Test Team (ATT) consists of various personnel who assist the IATO Test Conductor during the acceptance testing phases. Listed below are the DAAC role players and a brief description of their responsibilities.

DAAC M&O Staff: Performs maintenance and operations activities, including hardware installations.

Network Analyst (NA): Performs network functions, including monitoring the network's performance and integrity.

Performance Manager (PM): Addresses system performance issues and concerns.

Resource Manager (RM): Manages ECS site resources.

System Administrator (SA): Performs overall system maintenance, including system backups and software upgrades.

Data Pull Technician: Manages ingest, pull and processing activities. (DAAC)

Production Planner: Populates and maintains the production planning database. (DAAC)

Production Scheduler: Reviews, approves and activates the daily production schedule. (DAAC)

Data Ingest Technician: Oversees ingest activities including the handling of physical media (e.g., mounting tapes) from which input data are read. Responsibilities also includes verifying that all data reported on data availability schedules, product delivery notices, etc. are received, validated, accounted for, and archived. (DAAC)

Data Distribution Technician: Oversees distribution activities including handling of physical media (e.g., mounting tapes) onto which ECS data are written. (DAAC)

Science Software Integration Test Team (SSITT): Verifies that any and all updates to science software are thoroughly tested and verified before being permanently installed at the DAACs.

Listed below are the EOC role players and a brief description of their responsibilities.

Flight Operations Team (FOT): Executes activities performed at the EOC workstations including system initialization, scheduling, commanding, telemetry, and analysis activities. This teams consists of the FOT Planner/Scheduler, FOT Operations Coordinator, FOT Spacecraft Activity Controller, FOT Spacecraft Evaluator, and FOT Instrument Evaluator. Listed below is a brief description of responsibilities.

FOT Planner/Scheduler -- Performs spacecraft and instrument command loading and schedule generation. This includes receiving planning and scheduling requests, instrument microprocessor memory loads, and command activity definitions from the Instrument Operations Teams (IOTs).

FOT Operations Coordinator -- Coordinates operational tests and deliveries of FOS software and the project database.

FOT Spacecraft Activity Controller -- Responsible for EOC ground system elements, hardware, software, communications links, command capability, and Local Site Manager (LSM) functions. This includes controlling and verifying ground script execution, verifying commands and load contents, transmitting and verifying commands and load uplinks, and monitoring ground system performance.

FOT Operations Controller -- Responsible for real-time interface coordination, approving real-time command uplinks, and resolving real-time anomalies.

FOT Spacecraft Evaluator -- Monitors spacecraft subsystems during real-time operations and assists in spacecraft trend analysis and anomaly recognition and resolution. This includes reviewing spacecraft activity logs and monitoring ground script execution, spacecraft command activity, and spacecraft health and safety.

FOT Instrument Evaluator -- Monitors and analyzes instruments during real-time operations and assists in instrument trend analysis and anomaly recognition and resolution. This includes reviewing activity logs and monitoring ground script execution, instrument command activity, and instrument health and safety.

FOT Database Manager -- Responsible for database administration of the project database and operational data files (ODFs), maintaining data base access, validating user access/privileges, and investigating/documenting violations.

Instrument Operations Team (IOT) -- Executes activities performed at the CERES, MISR, MODIS, MOPITT and ASTER instrument workstations. This team consists of the IOT Planner/Scheduler and IOT Instrument Evaluator. These positions are not necessarily the actual positions utilized at Instrument Support Terminals (ISTs), but rather they represent the two major FOS-related roles accomplished at ISTs.

IOT Planner/Scheduler -- Provides the FOT with planning and scheduling requests, instrument microprocessor memory loads, and command activity definitions.

IOT Instrument Evaluator -- Performs real-time instrument command and telemetry monitoring and analysis. Responsible for instrument anomaly detection and contingency procedure execution, instrument command load validation, and instrument performance and trend analysis.

This page intentionally left blank.

4. Test Tools

This section identifies and describes the test tools (COTS and custom coded software) used in the execution of the Release A ECS Acceptance Test and the generation of data sets. The tools for requirements traceability, computer aided software test and performance, configuration management, network status and monitoring, and external interface simulators are discussed below. Table 4-1 summarizes the test tool suite available for Release A acceptance tests. Figure 4-1 shows the test tool categories used to exercise Release A acceptance tests.

Table 4-1. Release A Test Tool Descriptions

| TYPE | TOOL | DESCRIPTION |
|---|---------------------------------|--|
| Requirements Traceability Tool | RTM | The Requirements and Traceability Management tool provides an audit trail that enables multiple requirements to be traced. |
| Capture and Playback Tool | XRunner | XRunner is an automated software testing system for X window applications. XRunner automates the full range of software testing needs. Some of the gained functionality includes: output synchronization, text recognition, and a high-level testing mode that operates directly on GUI objects. |
| Automated Client/Server Testing System | Load Runner | LoadRunner is an automated testing system for client/server applications on UNIX/X platforms. By running multiple users in parallel off the server, LoadRunner enables the automation of load testing, performance testing, and system tuning. |
| Configuration Management Tool | Clear Case | Clear Case uses Version Object Base (VOB) to store the software versions. A VOB is a virtual directory tree of sources and other objects that is mounted like a disk partition. A project may have many VOBs. Any changes made by the developer after the software has been frozen will be conducted on a branch. The test organizations are responsible for merging the fixes (branches). |
| Nonconformance Reporting and Corrective Action Tool | DDTS | DDTS is a UNIX change management and bug tracking system that racks and manages changes throughout the life cycle of a hardware or software product from initial requirements planning to obsolescence in the field. DDTS works in conjunction with ClearCase. |
| Network Management Framework | HP Open View | HP OpenView is used to monitor any device that supports the Simple Network Management Protocol (SNMP). This tool will aid us in determining the status of the network and the devices on the network. |
| Network Analyzer/Monitor | Network Analyzer/ Sniffer | The Sniffer Network Analyzer assist in performance testing and monitors and generates traffic on Ethernet and FDDI networks. |
| Network Performance Tool | Netperf | Netperf is a benchmark tool which measures various aspects of network performance, primarily focusing on bulk data transfer and request/response performance using either the TCP or UDP and the Berkeley Sockets interface. |
| Source Simulator | TRMM/ TSDIS I/F Simulator | The TRMM I/F Simulator provides the basic protocol and interface functions employed by the SDPF/TSDIS. |
| EOSDIS Test System | ETS | ETS provides the capabilities to simulate EOS AM-1 spacecraft and instrument low rate telemetry data and high rate science data for the EOC and DAACs. The ETS also simulates the EDOS interface with the ECS. |

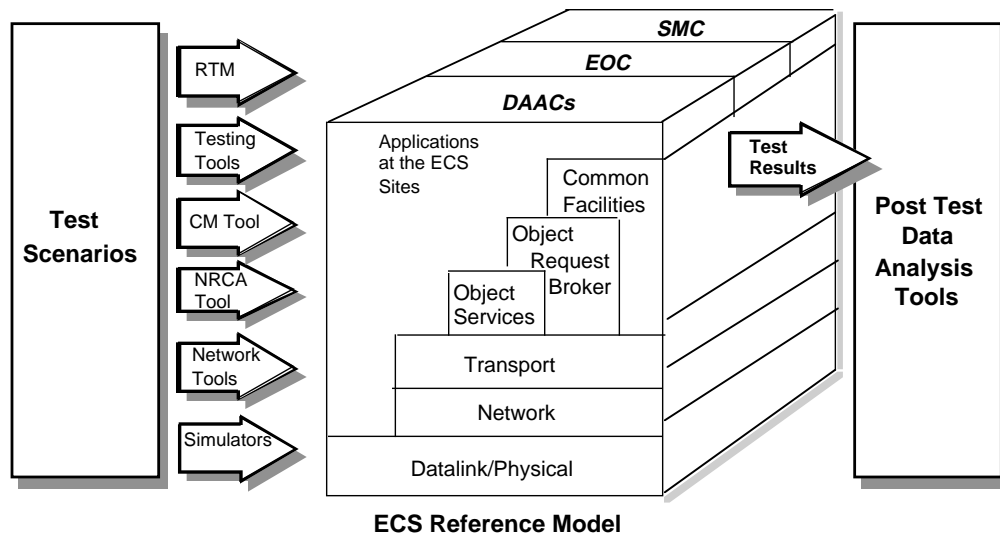


Figure 4-1. Release A Test Tool Integration

4.1 Requirements Traceability

The Requirements and Traceability Management (RTM) tools provides an audit trail for ECS requirements. This data dictionary provides definitions of classes and attributes in RTM database. Figure 4-2 depicts the RTM Class Definition and Table 4-2 provides a definition of each class.

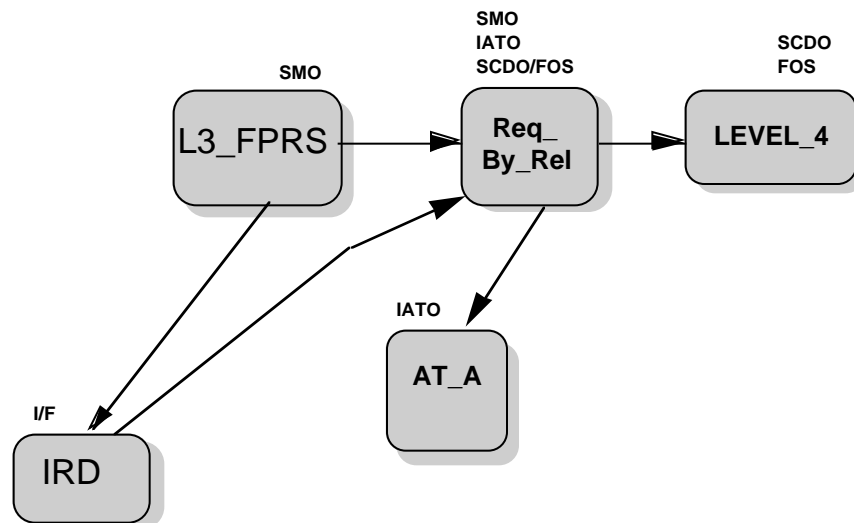


Figure 4-2. RTM Classes

Table 4.2 RTM Class Definitions

| CLASS | DEFINITION |
|--------------|---|
| L3_FPRS | Contains the Level 3, Functional and Performance Requirements Specifications received from GSFC 07/94 (423-41-02). Objects in this class can be mapped to objects in LEVEL_2, IRD, itself, and REQ_BY_REL classes. All relationships are defined as many-to-many relationship. |
| REQ_BY_REL | Contains requirements allocated for each formal release and are expanded from L3_FPRS and IRD classes. It is used by development engineers to develop the Level 4 requirements. Objects in this class are mapped to objects in LEVEL_4, CCR, IRD, L3_FPRS, AT_A, AT_B, IT_Ir1, IT_A, IT_B, and IT_FOS classes. All relationships are defined as many-to-many relationships. |
| LEVEL_4 | Contains Level 4 requirements which were expanded from the REQ_BY_REL class. Objects in this class are mapped to objects in REQ_BY_REL, IT_FOS, IT_A, IT_Ir1, IT_B, COTS, CCR, and COMPONENT classes. All relationships are defined as many-to-many relationship. |
| AT_A | Contains the system acceptance test sequences and test cases for A as identified in Acceptance Test Plan (ATP) and Acceptance Test Procedures. Objects in this class are mapped to objects in REQ_BY_REL class. Relationship between two classes is defined as many-to-many relationship. |
| IRD | Contains external interface requirements specified in Interface Requirements Documents (IRDs). Objects in this class are mapped to objects in L3_FPRS, CCR, and REQ_BY_REL classes. All relationships between classes are defined as many-to-many relationship. |

4.2 Computer Aided Software Test and Performance Tools

The Mercury XRunner and LoadRunner are computer aided software test and performance test tools used to assist in the automation of testing. XRunner is designed to automate the test process by capturing, in a script file, keyboard, mouse input and system under test (SUT) responses, and then playing back those inputs and comparing the results to those stored in an expected results directory. LoadRunner is used to simulate a large number of actual users, in order to measure the response time of a server in a client/server application. Both tools offer sophisticated programming capabilities through a C based language called Test Script Language (TSL), that can be used to drive the system under test much more extensively than would be possible with manual testing. It also offers the virtue of repeating the test sequence with fidelity. The XRunner and LoadRunner tools also provide very reliable playback of user input. Specific usage of XRunner and LoadRunner in ECS acceptance tests are discussed below.

4.2.1 XRunner Usage

The primary use of the XRunner tool is the automation of functional tests that involve heavy use of graphical user interfaces. Examples of such user interfaces are the Release A desktop Graphical User Interface (GUI), DAAC or SMC operator screens, and EOC operator screens.

4.2.2 LoadRunner Usage

LoadRunner is utilized for all response time testing that involves the Release A desktop GUI and during End-to-End tests that involve large numbers of test and operations personnel at multiple sites.

4.2.3 Test Execution Reports

Upon completion of a test script execution, both XRunner and LoadRunner automatically generate test execution reports. LoadRunner generates performance graphs for analysis.

4.3 Configuration Management Tools

The ECS Configuration Management Organization (CMO) is responsible for the management and control of the Software Development Library (SDL), the Non-Conformance Reporting and Corrective Action (NRCA) System, and the baseline configuration management of hardware and software. The CMO uses two software tools to support its effort: ClearCase and Distributed Defect Tracking System (DDTS).

4.3.1 ClearCase

The CMO utilizes ClearCase to manage and control the SDL which is the central repository for ECS software including test verification items. ClearCase, an automated software tracking tool, manages multiple versions of evolving software components; tracks which versions were used in software builds; performs builds of individual programs or entire releases according to user-defined version specifications; and enforces site-specific development policies. ClearCase scripts are provided by CMO to be used throughout the software development life cycle in order to standardize and automate the tracking of the information in the SDL. The project instruction PI CM-1-019 Software Development Library, describes the SDL, the role of ClearCase in the SDL, and the associated ClearCase scripts.

The following test items are stored and baselined by the CMO, via the Software Turnover Process, as they are finalized.

- Verification documents, including test plans, procedures, scripts, and reports.
- Test data sets, software and hardware configuration, including test tools.
- Unit-tested components, data sets, Segment hardware configuration, and COTS software, as described in COTS Process Model, PI SD-1-013.
- Verified Segment/element threads and builds.
- Verified system builds
- Integration system build for a release.
- Evaluation of test results

The items are retrieved from the SDL, via ClearCase when required to perform various verification activities at the sites.

The ECS policies and procedures for baselining test items and retrieving test items from CMO is defined in PI CM-1-025, Software Development Handbook.

Since Acceptance Testing of the ECS is conducted within a baselined configured environment, ClearCase is installed at each test site; and CMO electronically deploys the binary files (executable) of ECS software, at each test site, from the ECS Development Facility (EDF). In order to maintain the integrity of the test script and test data, CMO deploys IATO's test scripts and test data, in the same manner they deploy ECS binary files. This allows the Acceptance Tester, at each test site, to maintain a baseline of changes to the test script and/or test data for the purpose of work around.

4.3.2 Distributed Defect Tracking System (DDTS)

The DDTS is a software tool used to support the NRCA system for the CMO. The DDTS records nonconformance's and reflects the progress of nonconformance Reports through resolution and captures necessary information to document that progress. Through the production of management reports, DDTS provides management visibility and metrics to insure that NCRs are being worked in a timely and effective manner. The policies and procedures governing the usage of DDTS on ECS are defined in the Non-Conformance Reporting project instruction (PI), SD-1-014.

The NRCA system is the process for identifying, investigating, and resolving problems with the ECS during development, integration, installation, and acceptance test. To facilitate disposition and resolution of problems, the NRCA system and its processes emphasize tracking of responsibility, effective communication and delegation of authority. The NRCA system utilizes the DDTS to record and track software nonconformances. DDTS is customized by ECS to accurately reflect the progress of NCRs through resolution and captures necessary information to document that progress. Through the production of management reports, DDTS provides management visibility and metrics to insure that NCRs are being worked in a timely and effective manner.

4.4 Network Status and Monitoring

The three network tools utilized in acceptance tests are the HP OpenView, Sniffer Network Analyzer, and Netperf. Each are described below.

4.4.1 HP OpenView

The HP OpenView is network tool which monitors and controls the entire network environment at each ECS site. As a diagnostic tool, it has the capability to isolate faults quickly. The tool, which resides on the Local System Management (LSM) at each ECS test site, allows the user to display a map of the network environment at that local site for the LSM and the maps of all sites at the SMC. These maps are real-time interactive graphical representations which allow the user to detect network problems as they occur without having to update or refresh the display screen, and to diagnose network connectivity. The tool allows the user to create submaps of the map which can

be as small as a software component on the system. The Acceptance Test Team (ATT) utilizes this tool to introduce systems and/or network faults to the system.

4.4.2 Network Analyzer/Sniffer

The Network Analyzer/Sniffer is a performance testing tool which monitors and generates traffic on Ethernet and FDDI networks.

4.4.3 Netperf

Netperf is a benchmark tool which measures various aspects of network performance. Its primary focus is on bulk data transfer and request/response performance using either the TCP or UDP and the Berkeley Sockets interface.

4.5 External Interface Simulators

External interface simulators are used during acceptance testing when the real interfacing system is not available. For Release A, the simulators used for acceptance testing are described below.

4.5.1 TRMM Simulator (TRMMSIM)

The TRMM Simulator (TRMMSIM) is a subsystem of the DDF External Simulator (DESIM). The TRMMSIM provides the capability to test the ECS ability to ingest data from TSDIS and Pacor II (SDPF), and to send data to TSDIS. In order to perform these two tasks, the simulator consists of a consume part and a source part. The consume part of the simulator provides the capability to send a DAN and its associated data to, and receive a DAN and its associated data from an ECS DAAC.

The TRMMSIM operates in two modes, interactive and non-interactive. The interactive mode allows the user to modify and send message types (Authentication Response, DRVR, DDN, and DDA). This mode is useful when testing the interface for error handling. The non-interactive mode generates and sends the appropriate message type.

4.5.2 EOSDIS Test System (ETS)

The ETS is primarily designed to support ECS Release B and EOS Ground System (EGS) testing. For Release A, pending availability, the Low Rate System and the Multimode Portable Simulator is used for EOC testing. In this configuration, ETS provides simulated telemetry data.

4.6 Test Data

A variety of test data is required to exercise the Release A system at each site. This test data will be used in conjunction with the simulators described above to stimulate the system. Table 4-3 summarizes the missions, data sources and destinations and content required for Release A testing. Each of the site specific volumes contains detailed lists of test data sets.

Real test data provided by the instrument teams is used whenever possible. In situations where real data is not available, simulated data or similar heritage data is used for testing. The test data is validated and placed under configuration control prior to test execution.

Table 4-3. Release A Data Sources, Destination, and Data Content (1 of 2)

| Mission | Source | Destination | Data Content | Test Data Source/Contact |
|----------------|---------------|----------------------|--|-----------------------------------|
| AM-1 | Aster GDS | ECS at the EDC DAAC | Algorithms; Level-1A&1B Data; Expedited Products; Product Status; and User Data Search&Order Dialog. | ESDIS Test Data Working Group |
| AM-1 | Aster GDS | SMC at GSFC | Schedule; and Status Information. | ESDIS Test Data Working Group |
| AM-1 | Aster GDS | EOC | Planning; Scheduling. | ESDIS Test Data Working Group |
| AM-1 | EDOS | EOC | Real-Time Telemetry and Accounting. | ETS/GTSIM |
| AM-1 | EDOS | ECS at the GSFC DAAC | Level-0;Expedited Telemetry, Status; and Coordination Data. | ETS/ESDIS Test Data Working Group |
| AM-1 | EDOS | ECS at the LaRC DAAC | Level-0;Expedited Telemetry, Status; and Coordination Data. | ETS/ESDIS Test Data Working Group |
| AM-1 | EDOS | ECS at the EDC DAAC | Level-0;Expedited Telemetry, Status; and Coordination Data. | ETS/ESDIS Test Data Working Group |
| AM-1 | EDOS | SMC at GSFC | Status; and Coordination Data. | ETS/ESDIS Test Data Working Group |
| AM-1 | FDF | EOC | Basic Connectivity Test Messages | TICTOC/FDF ENGINEERING ORG |
| AM-1 | FDF | ECS at the LaRC DAAC | Repaired & Refined Orbit and Attitude Information. | TICTOC/FDF ENGINEERING ORG |
| AM-1 | FDF | ECS at the EDC DAAC | Repaired & Refined Orbit and Attitude Information. | TICTOC/FDF ENGINEERING ORG |
| AM-1 | FDF | ECS at the GSFC DAAC | Repaired & Refined Orbit and Attitude Information. | TICTOC/FDF ENGINEERING ORG |
| Landsat-7 | Landsat LPS | ECS at the EDC DAAC | Directory & Guide Information; Level-0R Data. | VO DAACS |
| AM-1 | NCC | EOC | Ground Configuration Messages | NCC Test System |
| TRMM | NOAA ADC | ECS at the GSFC DAAC | Ancillary and Correlative Data | Currently VO DAACS |
| Mission | Source | Destination | Data Content | Test Data Source/Contact |
| TRMM | NOAA ADC | ECS at the LaRC DAAC | Ancillary and Correlative Data. | Currently VO DAACS |
| TRMM | NOAA ADC | ECS at the EDC DAAC | Ancillary and Correlative Data. | Currently VO DAACS |
| AM-1 | SCF | EOC | Instrument software loads. | ESDIS Test Data Working Group |
| AM-1 | SCFs | ECS at the GSFC DAAC | Algorithms. | ESDIS Test Data Working Group |
| AM-1 | SCFs | ECS at the LaRC DAAC | Algorithms. | ESDIS Test Data Working Group |
| AM-1 | SCFs | ECS at the EDC DAAC | Algorithms, LANDSAT L0R Data | ESDIS Test Data Working Group |
| AM-1 | SCFs | ECS at the LaRC DAAC | CERES higher level products | ESDIS Test Data Working Group |

Table 4-3. Release A Data Sources, Destination, and Data Content (2 of 2)

| Mission | Source | Destination | Data Content | Test Data Source/Contact |
|----------------|-----------------|----------------------|--|---------------------------------|
| TRMM | SDPF | ECS at the LaRC DAAC | CERES Level-0, Housekeeping, Expedited Telemetry and Definitive Orbit Data. | ESDIS Test Data Working Group |
| TRMM | TSDIS | SMC at GSFC | Schedule Coordination & Adjudication for Data Exchange with DAACs; and Status Information | Internally Generated |
| TRMM | TSDIS | ECS at the GSFC DAAC | PR and TMI Level-1A through Level-3 Data Products; GV Data; Request For Ancillary/Correlative Data; and TRMM Product Delivery Schedules. | ESDIS via TRMM Project |
| TRMM | TSDIS | ECS at the GSFC DAAC | VIRS Level-1A through Level-3 Data Products; Request For Ancillary/Correlative Data; and TRMM Product Delivery Schedules. | ESDIS via TRMM Project |
| All Missions | Version-0 DAACs | ECS at the GSFC DAAC | Inter DAAC and Cross DAAC Communications; Inter-Operability; and Data Transfer. | VO DAACS |
| All Missions | Version-0 DAACs | ECS at the LaRC DAAC | Inter DAAC and Cross DAAC Communications; Inter-Operability; and Data Transfer. | VO DAACS |
| All Missions | Version-0 DAACs | ECS at the EDC DAAC | Inter DAAC and Cross DAAC Communications; Inter-Operability; and Data Transfer. | VO DAACS |

5. Test Execution and Coordination

This section describes the process by which formal acceptance testing is managed at the site on a daily basis. The responsibilities of the test manager and test engineers are also described.

5.1 Acceptance Test Planning

Acceptance test planning is formally presented in the Verification Plan (DID 401/VE1), the Acceptance Testing Management Plan (DID 415/VE1) and the Acceptance Test Plan (DID 409/VE1). Both the ATP and ATPr documents reference the requirements verification matrix contained in the Verification Specification (DID 403/VE1). Contents of the Verification Specification are, in turn, imported from the requirements matrix data base maintained by the RTM tool. The Configuration Management activities related to transferring software code is described in the ECS Configuration Management Plan (DID 102/MG1) and the Configuration Management Procedures (DID 103/MG3).

Volumes 1-5 of the ECS System Acceptance Test Procedures provides the detailed test procedures for each site. Appendix A provides the template and data field descriptions for the test procedures format used in these sections. The sequence of activities that lead up to the completion of the Release A acceptance testing is shown in Figure 5-1. It shows the series of acceptance test activities that take place, how they relate to the major ECS reviews, and their relationship with the documents produced. It also shows the activities and their relationships with the System I&T, and Operations Phases of the Release A acceptance testing life cycle.

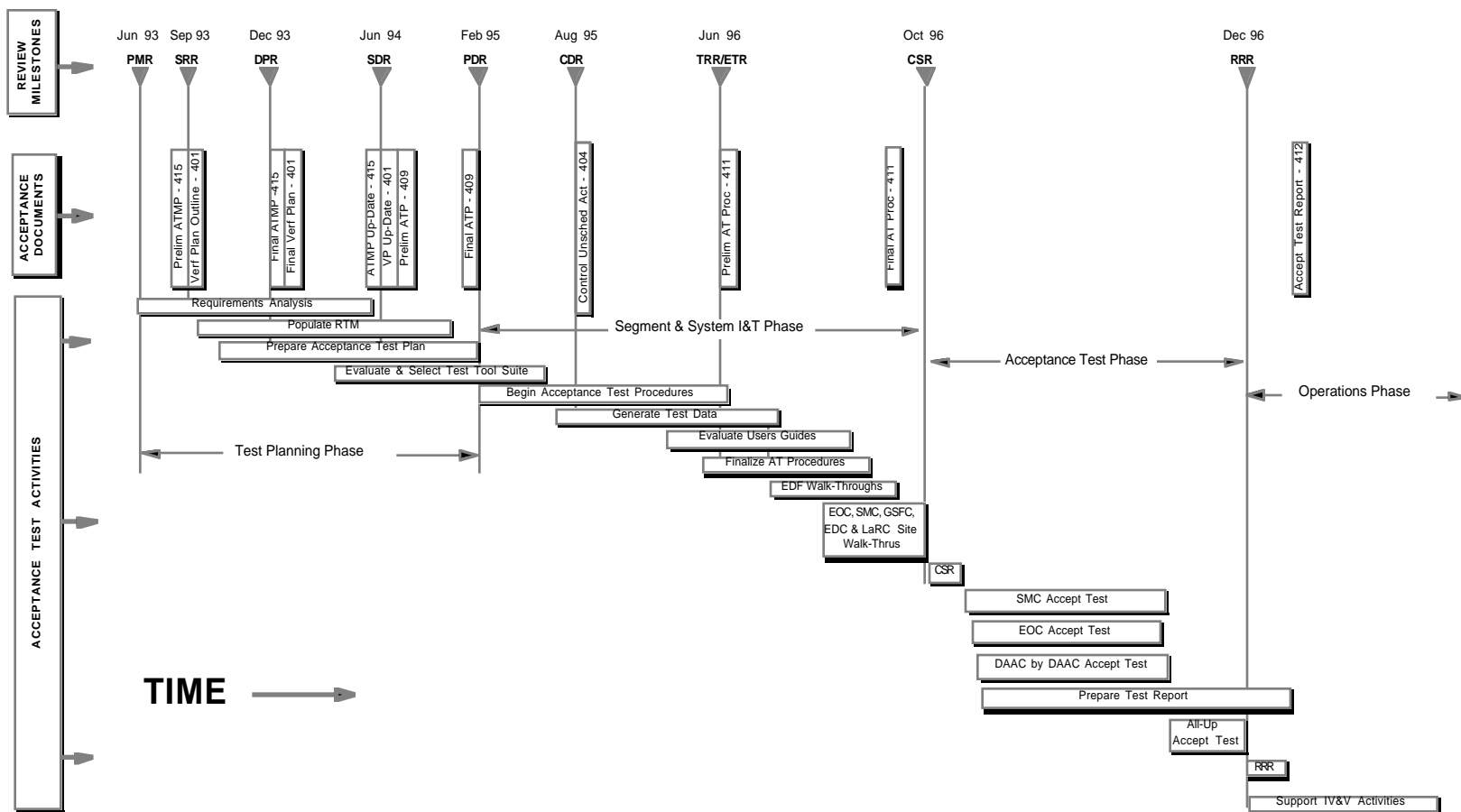


Figure 5-1. Release A Acceptance Test Life Cycle

5.2 Acceptance Test Preparation

The initial activities of acceptance test preparation are conducted at the ECS Development Facility (EDF). First, an inventory of the resources needed to perform acceptance tests is taken. Items inventoried include test input data, automated test tools, and technical documentation. If any required items are found to be missing or insufficient for acceptance test performance, corrective action is taken. Prior to CSR, walk-throughs of the entire Acceptance Test Procedure are conducted at the EDF to ensure proper format, contents, and completeness of the test scenarios and test plan. Additionally, concurrent with the execution of I&T, critical acceptance test sequences and test cases are executed by IATO against the I&T baseline to ensure that any major problems with either the Release, or the Acceptance Test Procedures and resources, are found at the EDF. During the EDF test activities, discrepancies are documented as NCRs. NCRs written during this time frame are controlled by the Release A CCB.

5.2.1 Software Pre-Install

Approximately 30 days prior to CSR, an ECS software pre-installation is performed at the applicable operational sites. The software used is a snapshot to the ECS system undergoing final system integration at the EDF. The pre-install serves as a pathfinder for the install of the formal delivery occurring after CSR. The activity is led by a development organization team consisting of developers and system I&T. Support is provided by configuration management and acceptance testing personnel, assisted by the M&O personnel already on site. A critical function of the pre install is to perform the DAAC specific configuration of the ECS, such as verifying network addressing, enabling DAAC-unique functions, and tailoring COTS configuration files.

Discrepancies observed during the software pre-install are formally filed as NCRs. Changes to site-specific configuration files formulated as a result of pre-install are forwarded to the EDF for incorporation into the formal baseline. The formal installation of the release is accomplished at the sites immediately following CSR to support acceptance test implementation.

5.2.2 Release A Acceptance Test Readiness Reviews

In conjunction with CSR, Acceptance Test Readiness Reviews (ATRRs) are conducted at the applicable operational sites by the ECS Maintenance and Operations (M&O) organization. During this time, each site's readiness to receive Release A is assessed. The ATRR assesses plans for software installation and for conducting Acceptance Tests in parallel with on-going site operations.

5.2.3 Release A Consent to Ship Review

Before the shipment of ECS Release A to the operational sites, a CSR is held to address the readiness of the release for delivery to the operational sites for testing. The purpose of the CSR is to:

- Review the results of integration and test activities

- Review the approach for installation and test of the release at the operational sites to ensure that disruptions to ongoing operational services are minimal or nonexistent
- Review the status of test procedures for operational system integration and acceptance testing
- Determine the readiness of the equipment and staff at the operational sites for release installation

The CSR includes a review of the software pre-installs at the operational sites, and the acceptance test preparation activities at the EDF. CSR review items include:

- DID 324/405-I&T Report (preliminary)
- DID 411-Acceptance Test Procedures
- DID 512-Maintainability Demonstration Test Plan
- DID 521-CSR Tabulation of Non-conformance Reports
- DID 603-Operation Readiness Plan
- DID 609-Operations' Reference Manual
- DID 611-Mission Operations Procedures
- DID 625-Training Material

Based on the CSR presentation and the delivered CDRL documents, a recommendation is made to ESDIS to accept or reject Release A. ESDIS makes the formal decision to ship or not to ship the release.

5.3 Acceptance Test Implementation

Following a successful CSR, Release A is formally installed at the applicable operational sites. The formal installation replaces the pre-installation efforts. The formal installation of Release A includes custom code and commercial-off-the-shelf (COTS) software and, as applicable, executables, load modules, test data sets, test tools, and documentation. The formal installation at the operational sites is performed by the I&T organization, supported by the CMO and the M&O organization.

Prior to the execution of test scenarios at the test sites, three final checks are performed. The first check consists of a survey of the operational sites where the release is to be tested. This pre-test site check is to provide confidence that each operational site is properly configured for formal acceptance testing. The next pre-test check consists of performing a selected set of test cases from Ir1 to ensure that existing operations at the site are not adversely affected by the installation of the new release. The final check consists of a walk-through of the entire set of acceptance test procedures to ensure site compatibility for the release. In the event that any discrepancies are observed during these three checks, the discrepancies are filed as NCRs in the NRCA system.

5.4 Test Execution and Error Handling

When the final checks have been successfully executed the actual commencement of the formal acceptance test are coordinated with the Site Manager by the Test Manager. All acceptance tests are conducted under the direction of the Test Manager who has absolute authority regarding all aspects of the execution of the acceptance test. This authority includes the assignment of priority to NCR's and their disposition and impact on ongoing testing. This authority may be delegated by the Test Manager to the Test Conductor at specific times such as absences from the sites or off shifts hours. For additional information concerning duties of other acceptance test participants, see the Verification Plan (DID 401/VE1).

At each test site, site-specific and all up test phases are executed. The site-specific test focuses on each individual site, and the all-up test phase includes all sites and elements testing simultaneously. At each site, the final scenario to be executed is an acceptance test demonstration, which exercises a comprehensive sequence of events verifying the overall site-specific and ECS-wide capabilities of the release.

In unusual circumstances, where there is an unscheduled interruption in the execution of a planned Acceptance Test session, the Procedures For Control of Unscheduled Activities During Verification for the ECS Project (DID 404/VE2) may be invoked. This document describes the process used to resolve unplanned activities during the verification process.

5.4.1 Non-Conformance Reporting

Discrepancies observed during Acceptance Testing are filed as NCRs and entered into the NRCA system for disposition by the Release A CCB. If the CCB determines that modifications are necessary, the software is returned to the developers for correction. After the NCRs are corrected and test criteria have been met, the results are reported to the Release A CCB. The Release A CCB authorizes or rejects delivery of the software fixes to the operational sites. Figure 5-2 graphically depicts the NCR process throughout the acceptance test phase. Figure 5-3 provide sample reports available from the NRCA system.

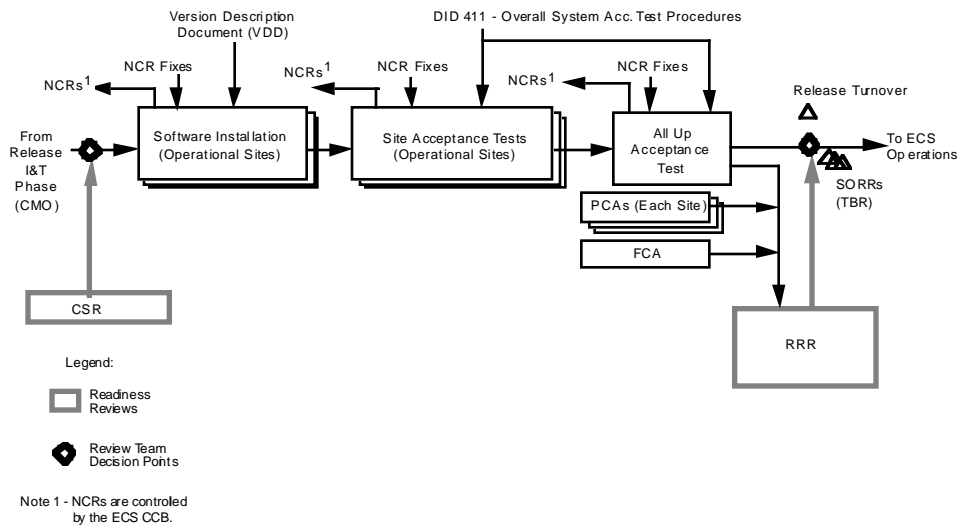


Figure 5-2. Acceptance Test NCR Process

Total Problems by Severity

| | |
|--------------|------------|
| Severity 1 | 25 (17%) |
| Severity 2 | 35 (24%) |
| Severity 3 | 48 (33%) |
| Severity 4 | 23 (16%) |
| Severity 5 | 15 (10%) |
| TOTAL | 146 |

Unresolved Problems

| | |
|--------------|----------|
| Severity 1 | 0 |
| Severity 2 | 0 |
| Severity 3 | 0 |
| Severity 4 | 0 |
| Severity 5 | 0 |
| TOTAL | 0 |

Total Problems by State

| | |
|---------------|------------|
| New | 0 (0%) |
| Assign-Eval | 0 (0%) |
| Assign-Fix | 0 (0%) |
| Fixed | 0 (0%) |
| Assign-Verify | 0 (0%) |
| Verified | 0 (0%) |
| Closed | 142 (97%) |
| Duplicate | 4 (3%) |
| TOTAL | 146 |

Figure 5-3. NRCA System Sample Reports

5.4.2 Acceptance Test Delays

As acceptance testing continues, the severity and number of unresolved NCRs are monitored on a daily basis, and compared with the established acceptance test criteria. As circumstances dictate, it may be necessary to halt testing based on the number and severity of open NCRs and resume testing when they have been corrected and incorporated in a new test version. Table 5-2 describes the discrepancy classification and priority scheme. Also, when an NCR documents an instance that impedes further testing, acceptance testing may be halted at the discretion of the Test Manager. In such cases, the release is returned to the responsible development organizations.

Table 5-1. Discrepancy Classification and Priority

| Classification | Description |
|----------------|---|
| Severity 1 | Catastrophic bug without work around that causes total failure or unrecoverable data loss. |
| Severity 2 | Bug which severely impairs functionality. Work around might exist but is unsatisfactory. |
| Severity 3 | Bug that causes failure of non critical system aspects. There is a reasonably satisfactory work around. |
| Severity 4 | Bug of minor significance. Work around exists or, if not, the impairment is slight. |
| Severity 5 | Very minor defect. Work around exists or the problem can be ignored. |

CM tracks the product changes and revisions that result from correcting nonconformances. The revised version is returned to the test site. The acceptance test conductor then retests the new version using the scenarios that uncovered the original discrepancy to determine if the nonconformance was corrected. In addition, some regression testing may be conducted to make sure that the fix has not adversely affected other functions previously tested.

5.4.3 Discrepancies At Other Sites

As the acceptance testing proceeds from site to site, discrepancies may be uncovered which were not observed during tests at previous sites. If the mitigation of these discrepancies requires the generation of a new release version, retesting of the new version at each site is conducted during the all-up ECS acceptance test. Additional information on testing during verification is found in the Procedures for Control of Unscheduled Activities During Verification (DID 404-CD-001-001).

5.4.4 Physical Configuration Audits

The objective of the Physical Configuration Audits (PCAs) is to verify at each operational site that the “as-built” Release conforms to its design documentation. The PCA includes a detailed audit of engineering drawings, specifications, technical data for hardware; and a detailed audit of design documentation, listings, and manuals for software. The PCAs are conducted by an ECS Project team lead by CMO, and witnessed, at their option, by the ECS Project Quality Office (QO) and ESDIS. The results are presented at the Release Readiness Review (RRR) and documented in DID 506, Audit Reports. Approval of the Release A PCAs by ESDIS establishes the formal Product Baseline for Release A.

5.4.5 Functional Configuration Audit

The objective of the Functional Configuration Audit (FCA) is to verify that Release A's actual performance complies with its requirements and interface specifications. FCAs for Release A are satisfied by an inspection of the Acceptance Test results and are conducted by an ECS Project team led by CMO. The FCA activities are witnessed, at their option, by the ECS Project Quality Office (QO) and ESDIS. The results are presented at the Release Readiness Review (RRR) and documented in DID 506, Audit Reports.

5.4.6 Release Readiness Review (RRR)

After testing is complete, the IATO leads the Release Readiness Review (RRR) and reports on the results of the Release Acceptance Test to the ESDIS review team. The results presented in the RRR provides the basis by which ESDIS determines if the release is ready to proceed to IV&V operations. The ECS System Acceptance Test Report (DID 412/VE2) and the Acceptance Data Package (DID 535/PA1) are delivered to the Government four weeks after RRR to provide detailed test results, their analysis and a summary of open items to be corrected in the next version.

5.5 Test Logs

The test results are logged into the Test Conductor's site test log on a daily basis. Each entry contains the time and date, test procedure number, and results of the test procedure, including NCRs written during the tests. Figure 5-4 is an example of the test log summary used for acceptance tests. Any deviations from the test procedures is recorded in the test logs.

In addition, the actual procedures are marked up to indicate temporary (black or blue ink) and permanent (red ink) changes. Refer to the Procedures For Control of Unscheduled Activities During Verification for the ECS Project (DID 404/VE2) for the detailed process. All procedure markups, test logs, and supporting documentation are included in the formal Test Report to be delivered following RRR.

| | | | |
|-----------------------------|------------|------------------------------|---------|
| Sequence: | | | |
| Test Procedure Name: | | | |
| Test Procedure ID: | | | |
| | | | |
| Test Location: | Site: | | |
| S/W Config./ Version: | | | |
| H/W Config./ Host Names: | | | |
| Test Data: | | | |
| Test Tools/ Scripts: | | | |
| Test Date: | | | |
| Witness(es): | | | |
| Comments: | Test Time: | | |
| | | | |
| | | | |
| | | | |
| | | | |
| NCRs Written: | | | |
| NCRs Verified: | | | |
| NCRs Un-Verified: | | | |
| n Pass | Fail | Partial Pass/Fail | |
| 1st Run | Formal Run | Retest | Release |
| Tester Signature(s) | | Witness Signature(s): | |
| _____ | | _____ | |
| _____ | | _____ | |
| _____ | | _____ | |

Figure 5-4. Test Log Summary

This page intentionally left blank.

6. Release A Test Schedule

The current plans call for conducting Release A acceptance testing during the two month period following the CSR, which is scheduled to occur October 1, 1996. The plan specifies conducting acceptance tests in three sessions. The first session occurs during the first three week period following CSR at SMC, EOC, GSFC, and LaRC. The second session occurs the following two weeks at EDC, with SMC and EOC remaining involved to participate where mutual testing is required. The final session occurs during the remaining three weeks of the period. During the final three weeks an All-Up End-to-End session occurs with all five sites participating.

6.1 Test Schedule

Figure 6-1 includes the detailed activity schedule for acceptance tests. The detailed test activity schedule for individual site is included in the respective volume.

Several assumptions were made for the overall acceptance test schedule.

- 1) Each test will take approximately 3 hours to execute,
- 2) Work proceeds five days per week, 8 hours/day,
- 3) No more than 2 tests will be ongoing at any one time at each site,
- 4) No problems/failures/delays occur.

These assumptions are validated or adjusted during the various test activities describe in Figure 6-1. As schedule adjustments are made, the details are presented during technical interface and management meetings with both the ECS project personnel and the Government.

The final detailed site schedules are coordinated with each site prior to the conduct of acceptance tests and during site personnel interface meetings. The final schedule includes dates, times and duration for all formal acceptance testing that may occur at each site.

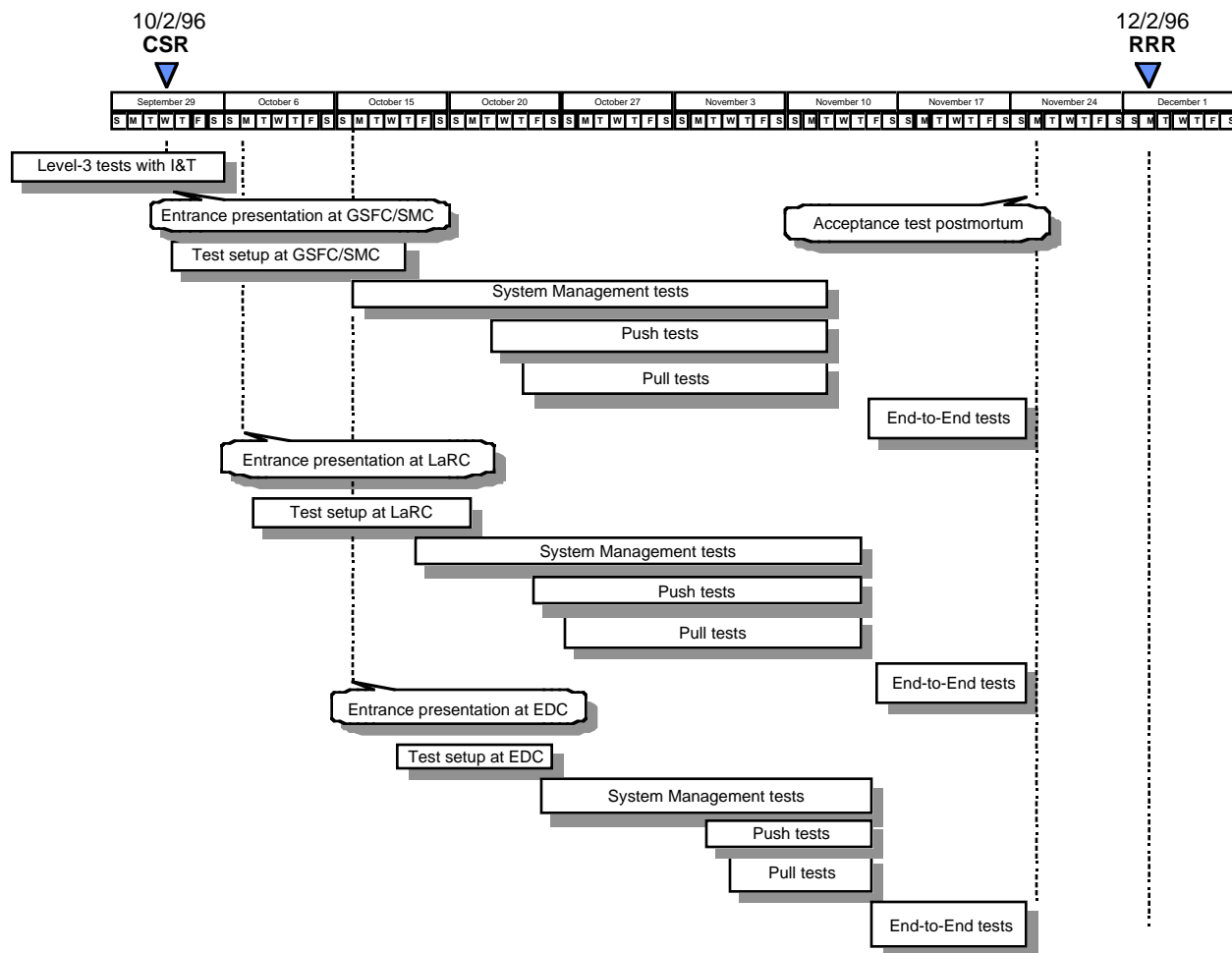


Figure 6-1 Release A Detail Test Activity Schedule

7. Overview

The System Monitoring and Coordination Center (SMC) is a part of NASA's Earth Observing System Data and Information System (EOSDIS) Core System (ECS). EOSDIS, when fully deployed will consist of eight Distributed Active Archive Centers (DAACs). The SMC's role is to coordinate policy issues amongst the DAACs, provide user registration information, toolkit information and monitor the overall health of the ECS.

7.1 SMC Release A Functions

ECS subsystems provide mission and operations functionality for Release A. Key ECS related mission and operations activities supported by the SMC are shown in Table 7-1.

Table 7-1. SMC Operations Support Functions

| SMC Operational Roles | ECS Capability |
|--|---|
| User Registration | Communications Subsystem |
| System Performance Analysis | Systems Management Subsystem |
| Security Management Analysis | Systems Management Subsystem |
| Fault Management Analysis | Systems Management Subsystem |
| Accountability, Accounting & Billing * | Systems Management Subsystem |
| Configuration Management | Systems Management Subsystem |
| ECS Policy Dissemination | Systems Management Subsystem Communication Subsystem |

7.2 SMC Release A External Interfaces

The SMC will interface with multiple external organizations and to each ECS DAAC. Figure 7-1 schematically illustrates the interfaces between the SMC and its external entities (sinks and sources of data). The figure enumerates data flows which are elaborated upon in Table 7-2.

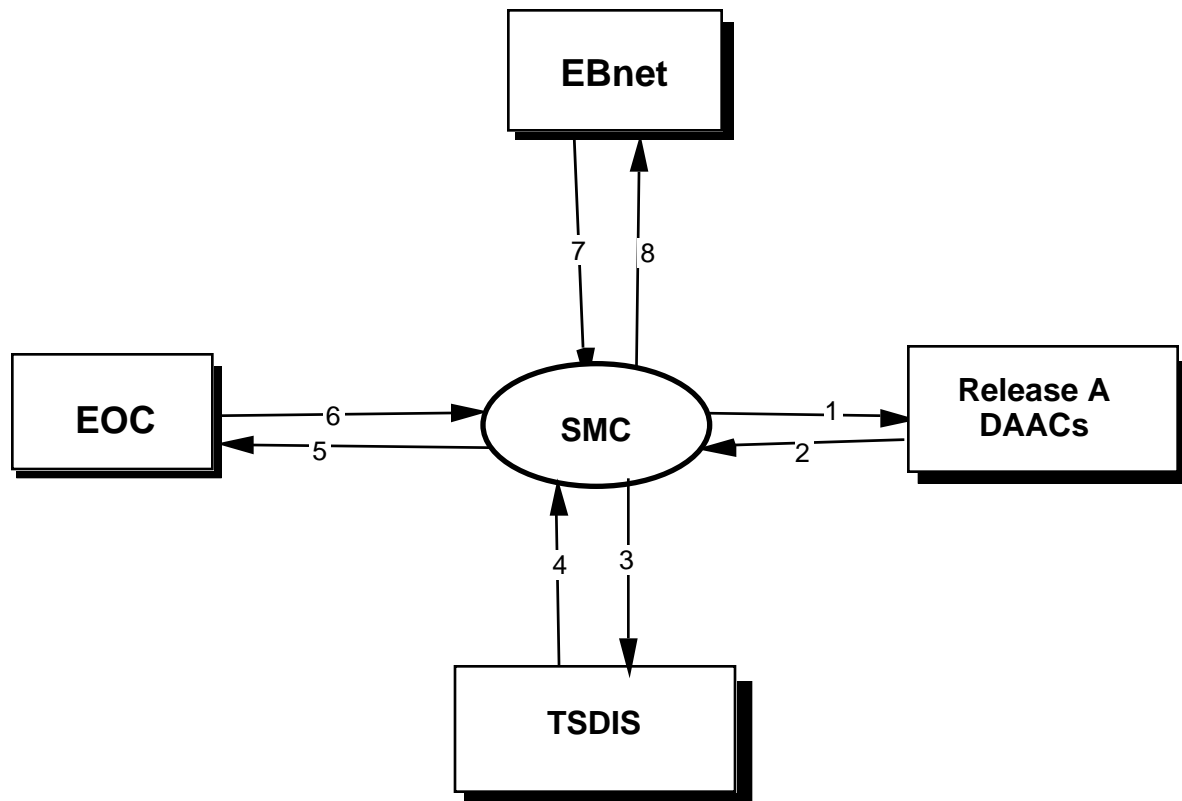


Figure 7-1. SMC External Interfaces

The following further describes the external entities, including those identified to support interface testing:

- Release A DAACs - At Release A, the SMC will interface with the GSFC, LaRC, and EDC DAACs. Policy information, originating from the ESDIS project office, system and network performance and management summary data, and user registration data will be exchanged between the SMC and the Local System Management (LSM) element at each DAAC. This information is identified in Table 7-2.
- EOSDIS Backbone Network (EBnet) - The EBnet is the primary interface between the SMC, DAACs, EDOS, other ECS assets, and non-ECS elements. The SMC interface with the EBnet is to monitor and exchange status information between the EBnet and ECS.
- TSDIS - The SMC interface with TSDIS is to monitor the status of the TSDIS. At Release A this interface is via email messages.
- EOC - The SMC interface with EOC, at Release A is via the LSM at the EOC. This interface is used for early testing of the EOC - SMC interface by transfer of status information and performance summary data from the EOC to the SMC.

Table 7-2. SMC ECS Release A Data Flow Interfaces

| Flow No. | Source | Destination | Data Types | Data Volume | Frequency |
|----------|-------------------|-------------------|-------------------------------|-------------|-------------------------|
| 1 | SMC | Rel A DAACs (MSS) | Policies | low | as required |
| 1 | SMC | Rel A DAACs (MSS) | Conflict Resolution | low | as required |
| 1 | SMC | Rel A DAACs (MSS) | Procedures | low | as required |
| 1 | SMC | Rel A DAACs (MSS) | Directives | low | as required |
| 2 | Rel A DAACs (MSS) | SMC | Conflict Resolution Request | low | as required |
| 2 | Rel A DAACs (MSS) | SMC | Status | low | as required |
| 2 | Rel A DAACs (MSS) | SMC | Performance | low | as required |
| 3 | SMC | TSDIS | Status Request | low | as required (via email) |
| 4 | TSDIS | SMC | Status | low | as required (via email) |
| 5 | SMC | EOC (LSM) | Status Request | low | as required |
| 6 | EOC (LSM) | SMC | Status | low | as required |
| 7 | EBnet | SMC | Status, fault and performance | low | s required |
| 8 | SMC | EBnet | Status Request | low | as required |

7.2.1 SMC Facility and Test Environment

The SMC is located at the Goddard Space Flight Center (GSFC) in Greenbelt, Maryland. Figure 7-2 shows the SMC location at the GSFC.

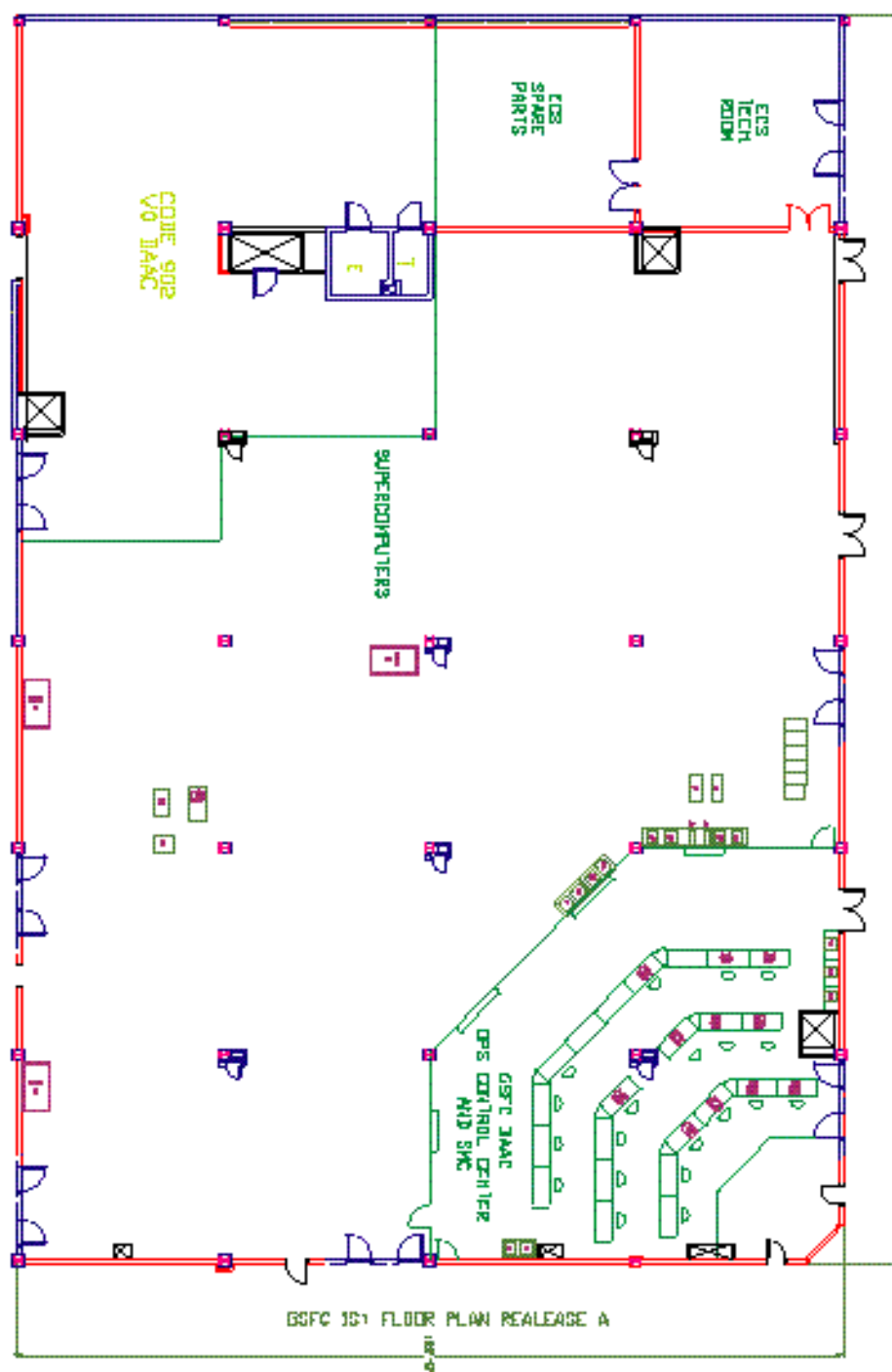


Figure 7-2. Location of the SMC at GSFC

7.2.2 SMC Test Environment Safety Considerations

The Hazard Analyses for the ECS Project (DID 513) considered both hardware and software caused hazards for each element and segment of ECS. Hazards to ECS personnel and to ECS equipment, and potential hazards external to ECS were considered. This analysis concluded that the effect of ongoing and future planning and implementation processes to purchase, verify, integrate and test, install, operate and maintain COTS hardware minimizes the potential for a ground system hazardous condition to personnel or equipment. These various processes and the documents that describe them are:

- Procurement of COTS hardware to commercial practice UL performance and safety standards. Other commercial standards such as ANSI, BICSI, CCITT, EIA, IEEE, ISO, and NEC may also be applicable. The COTS hardware installed in the user environment has been engineered for the user desktop operating environment with enclosed components and no exposure to moving parts or electrical discharge. The COTS hardware installed in the data center environment is accessible only to authorized, trained and certified operators and maintainers.
- Installation and Facility Planning to provide the DAACs with site specific Installation Plans and the ECS Facilities Plan (DID 302) to provide the planning necessary to assure that each ECS component meets all requirements for interfacing with the facilities in which they are located. The Facilities Plan contains physical layout, electrical power requirements, air conditioning requirements, antenna foundation, final equipment layout, mechanical/electrical loads, and functional arrangements.
- Environmental Control Planning to identify, in the Environmental Control Plan (DID 532), suitable environmental and cleanliness controls for all areas used for the operation, storage, maintenance, repair, inspection, or test of system equipment.
- Maintenance Planning, in the COTS Maintenance Plan (DID 613), to describe policies and procedures to be applied to maintenance of all hardware and software under M&O responsibility.
- M&O Procedures and the Operational Readiness Plan (DID 603) to describe the processes to assure all elements are in a state of operational readiness at all times.
- M&O Personnel Certification and Training to define the certification and COTS training required to prepare personnel to operate, maintain, and use the ECS. The COTS Training Plan (DID 622) and the M&O Certification Plan (DID 626) detail the approach and procedures required.
- Security Planning documents the approach to physical, informational and personnel security in the ECS Security Plan (DID 214).
- Disaster Recovery and Emergency Preparedness Planning is contained in the EDF Disaster Recovery Plan which provides for the safety and the protection of HAIS and the safeguarding of NASA computer resources and data assets. The Emergency Preparedness Plan focuses on personnel, visitors, and non-data assets.

During the pre-test meeting with SMC management, the following safety risks are determined:

- a. Identification of hazardous situations and/or operations
- b. Precautions and safety instructions to insure the safety of all personnel
- c. Precautions and safety instructions to prevent degradation of test articles and measuring equipment
- d. Environmental and/or other conditions to be maintained within tolerances
- e. Specifications for facility, equipment maintenance, housekeeping, certification, inspection, safety and handling requirements before, during and after test activities.

The ATO Test Conductor coordinates with SMC and ECS management and maintenance and operations personnel, and the Quality Office representatives concerning safety issues. If equipment, environmental, or personnel safety concerns arise, the Test Conductor immediately takes steps to ensure the safety of the personnel and equipment, notifies SMC management, and coordinates corrective actions.

7.3 SMC Configuration

Following a successful CSR, Release A is formally installed at the SMC. The formal installation of Release A includes custom code and commercial-off-the-shelf (COTS) software and, as applicable, executables, load modules, test data sets, test tools, and documentation. The formal installation at the operational sites is performed by the I&T organization, supported by the CMO and the M&O organization. The system configuration needed to perform the acceptance test sequences is described in Table 7-3.

Table 7-3 Release A SMC Release A System Configuration (1 of 2)

| Subsystem | HWC/CSCI | Platform | Custom Executables | COTS |
|-----------|----------|--|---|---|
| CSS | DHCI | CSS-SMC-1 (CSS server) and MSS-SMC-5 (MSS server) | DCE Directory, Security and Time servers, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, net.h++, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, mail server, Crack, Npassword, TCP Wrappers, Tripwire |
| MSS | MSSHCI | MSS-SMC-5 (MSS server) and CSS-SMC-1 (CSS server) | MsAgDpty, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, net.h++, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape, Sybase server, essm, sqr wkbch, PNM, HPOV, Crack, Npassword, TCP Wrappers, Tripwire |
| MSS | MSSHCI | MSS-SMC-1 | Clearcase server, peer agent, Inventory change manager (SoftPC/MS Office) | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase server and client, tools.h++, dbtools.h++, Remedy, tivoli client, wabi/office, netscape server (must be configured for DNS lookup), sybase client, Crack, Npassword, TCP Wrappers, Tripwire |
| MSS | MSSHCI | MSS-SMC-3 (MSS WS) | GUI executables | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, Crack, Npassword, TCP Wrappers, Tripwire |
| CSS | DCHI | CSS-SMC-2 (BB server) | Ingest operator GUI, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, Bulletin Board (NNTP), Crack, Npassword, TCP Wrappers, Tripwire |
| Client | DESKT | All operator workstations and servers (if xterms access servers) | EcsDesktop | ROGUEWAVE tools.h++ OODCE DCE C/C++ Doug Young's Library for Motiff/C++ 1992 Epak Widgets |
| | | | | Motif Window Manager, mwm (Solaris or SunOS) or platform-dependent alternative: Vuwem (HP), 4Dwm (SGI), NCDs (NCDwm), etc. |
| | | | | Web browser: Netscape |

Table 7-3 Release A SMC Release A System Configuration (2 of 2)

| Subsystem | HWC/CSCI | Platform | Custom Executables | COTS |
|-----------|----------|----------|---|---|
| | | | | DCE OODCE Motif or CDE with equivalent Motif version ICS Builder Xcessory ICS EPak widgets RogueWave tools.h++ C/C++ compilers and debuggers |
| | | | | Doug Youngs's C++ library for Motif 1992 version ECS C++ widget wrapper library (TBD) |
| Client | WKBCH | | User Registration Tool User Profile Tool | Same as Client |

*Remedy Trouble ticketing is installed only on the GSFC MSS server.

* All platforms that have Remedy indicated will have access via Netscape browser.

7.3.1 SMC Hardware Configuration

The SMC hardware configuration, as illustrated in Figure 7-3, SMC Hardware Configuration, is by and large identical to the MSS and CSS subsystem designs for the LSM at each DAAC, with the exception of the bulletin board server which resides only at the SMC.

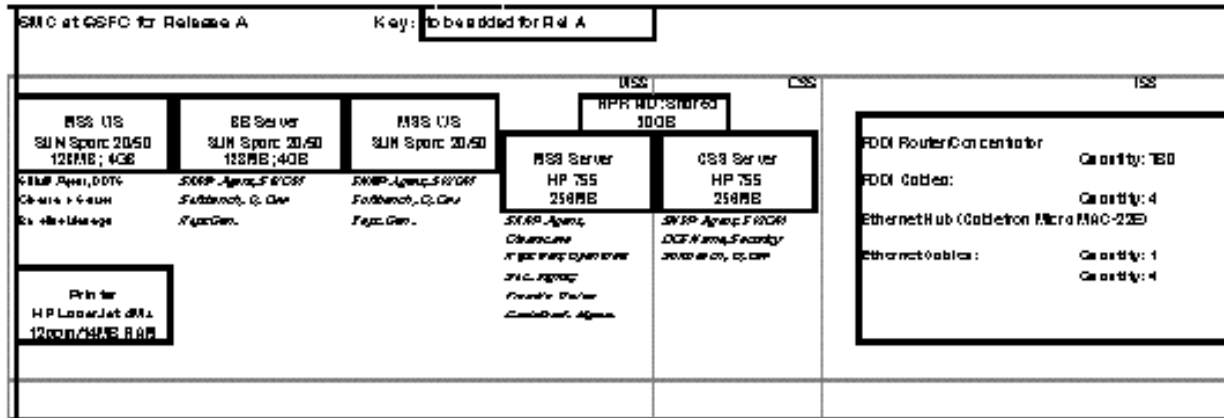


Figure 7-3. SMC Hardware Configuration

7.3.2 SMC Network Configuration

The SMC network architecture, as illustrated in Figure 7-4, consists of two FDDI LANs. The Enterprise Communications Server and the Enterprise Management Server connect directly to one of the FDDI rings, and the Management Workstations and printers are attached to Ethernet networks bridged to the FDDI ring via an Ethernet-to-FDDI hub. Since the Bulletin Board Server (BBS) is accessible by the general public, it is attached to a separate FDDI ring to facilitate increased security and to segregate BBS traffic from the rest of the SMC.

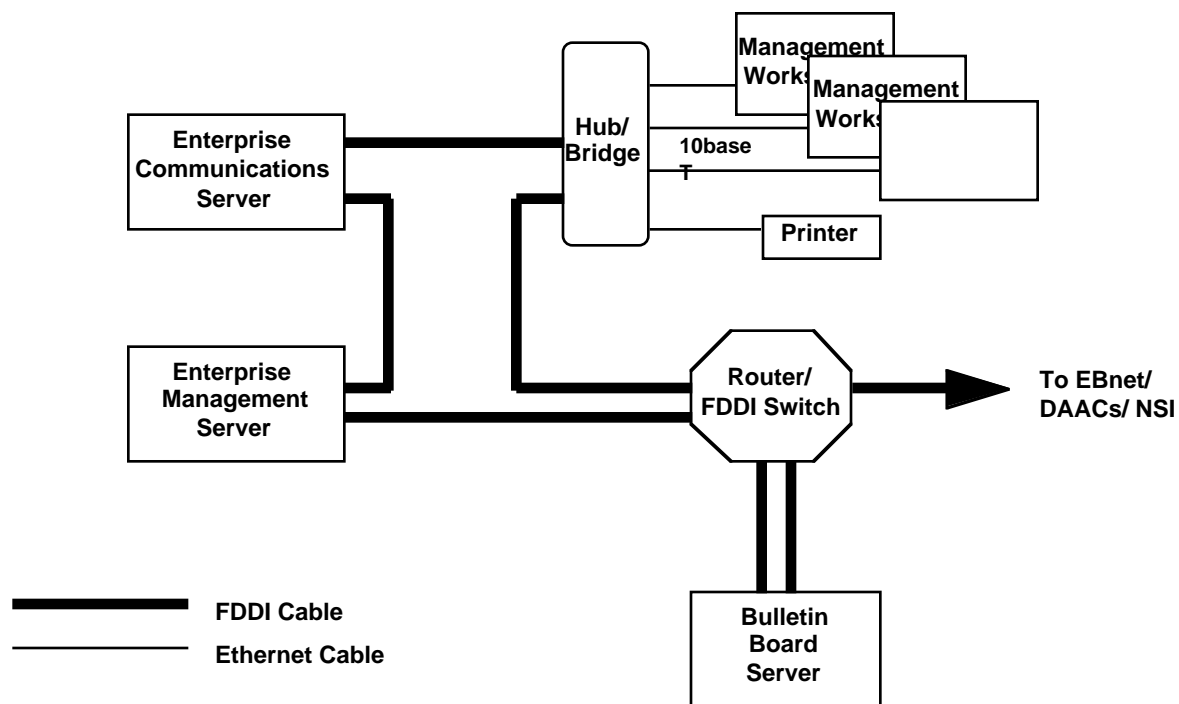


Figure 7-4. SMC Network Architecture

7.3.3 SMC Software Configuration

The SMC is composed of three ECS subsystem components, the Management Subsystem, the Communications Subsystem, and the Internetworking Subsystem. The SMC is composed of components of the Systems Management Subsystem, the Communications Subsystem and Internetworking Subsystem. These subsystems are further broken down into hardware and software elements, as illustrated in Figure 7-5.

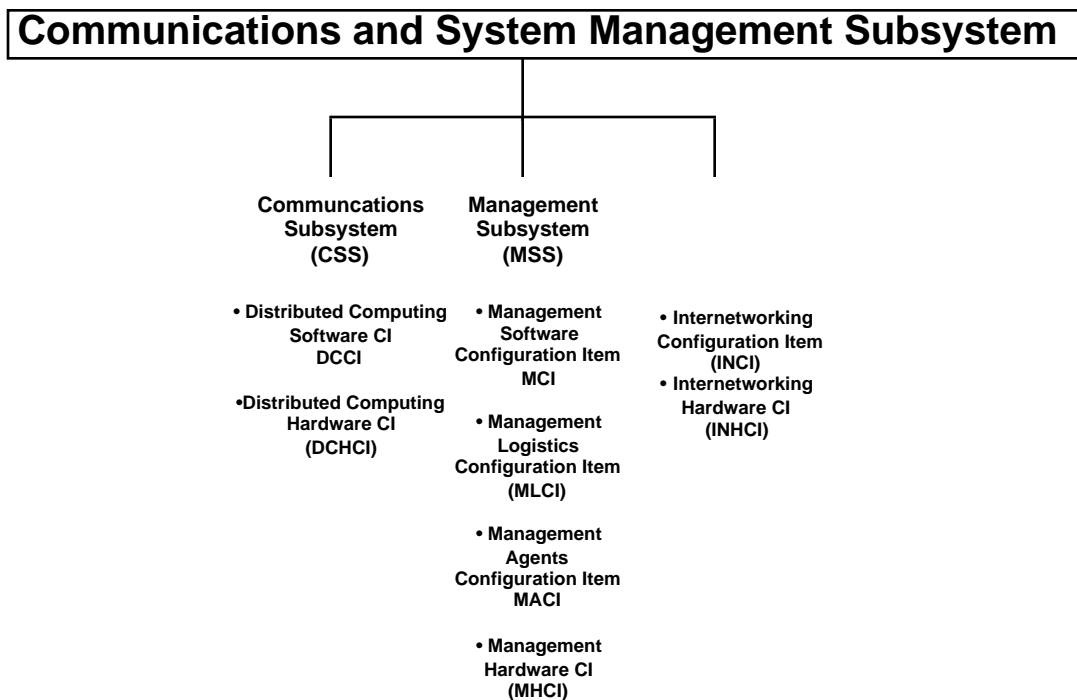


Figure 7-5. Communications and System Management Subsystems

Below is a brief overview of the ECS software subsystems. A more comprehensive description can be found in the Release A System Monitoring and Coordination Center Design Specification for the ECS Project (DID 305).

- **Management Subsystem (MSS):** The Management Subsystem (MSS) provides enterprise management (network and system management) for all ECS resources including: commercial hardware (including computers, peripherals, and network routing devices), commercial software, and custom applications. Enterprise management reduces overall development and equipment costs, improves operational robustness, and promotes compatibility with evolving industry and government standards. Consistent with current industry trends, the MSS thus manages both ECS's network resources per EBnet requirements and ECS's host/application resources per SMC requirements. Additionally MSS also supports many requirements allocated to SDPS and FOS for management data collection and analysis/distribution.

The MSS allocates services to both the system-wide and local levels. With few exceptions, the management services is fully decentralized, no single point of failure exists which would preclude user access. In principle every service is distributed unless there is an overriding reason for it to be centralized. MSS has two primary key specialization's: Enterprise Monitor and Coordination Services and Local System Management Services.

For IR-1 and Release A not all of the MSS services are fully implemented, some are provided through COTS and COTS customization, while others are provided through the use of Office Automation (OA) tools.

- **Communications Subsystem (CSS):** The CSS services include Object Services, Distributed Object Framework (DOF) and Common Facility Services. Support in this subsystem area is provided for peer-to-peer, advanced distributed, messaging, management, and event-handling communications facilities. These services typically appear on communicating end-systems across an internetwork and are not layered, but hierarchical in nature. Additionally, services to support communicating entities are provided, included directory, security, time, and other ancillary services. The services of the Communications Subsystem are functionally dependent on the services of the Internetworking Subsystem. The services of the common facility, object and DOF are the fundamental set of interfaces for all CSMS management and FOS and SDPS user access (i.e., pull) domain services. The DOF services are the fundamental set of dependencies of the common facility and object services.
- **Internetworking Subsystem (ISS):** The Internetworking Subsystem provides for the transparent transfer of data between end systems within local and wide area networks. The ESN LANs are responsible for transfer of data within the DAACs, SMC and EOC. ECS interfaces with external systems and DAAC to DAAC communications are provided by the EOSDIS Backbone Network (EBnet). EBnet's primary function is to transfer data between DAACs, including both product data and inter-DAAC queries and metadata responses. Other networks, such as NSI, provide wide-area services to ECS. In addition, "Campus" networks, which form the existing networking infrastructure at the ECS locations, provides connectivity to EOSDIS components such as SCFs and ISTs.

7.4 Acceptance Test Preparation

ATO holds an Acceptance Test kick-off briefing with SMC management personnel. The kick-off meeting discusses the following:

- SMC's readiness to conduct Acceptance Test
 - Results of hardware and software installation
 - External interface availability
- Required personnel
- Daily test execution schedules

7.4.1 SMC's Site Readiness to Conduct Acceptance Test

The results of the hardware and software installation, and any associated problems, are analyzed by SMC management and ATO during the kick-off meeting. In addition, SMC management verifies the status of the necessary external interfaces and the expected site layout. The external interfaces needed for SMC Acceptance Tests are depicted in Figure 7.1. Figure 7-2 depicts the expected SMC site layout.

7.4.2 Required Personnel

During the kick-off meeting, SMC management personnel have an opportunity to review and verify that the needed SMC personnel are available to conduct the planned test events. Sections 8-12 lists the necessary SMC personnel needed for each test sequence. Acceptance testing is a formal process that requires the coordination of different organizations. Each organization has well-defined roles and responsibilities for the acceptance testing process. Below is a summary of these organizations and personnel.

Acceptance Test Organization (ATO): The ATO assigns a test manager to coordinate and run acceptance testing. The ATO also provides test conductors to execute the step-by-step procedures that are defined in the ATPr. Test conductors also write, collect, and track nonconformance reports and determine the impact of these reports on test plans, scenarios, test cases, and procedures.

Quality Office (QO): The QO provides a representative to witness the execution of acceptance testing. The QO also tracks the status of nonconformance reports and reviews them prior to closure to ensure that the required actions have been completed.

Configuration and Data Management Organization: The Configuration Management Office (CMO) coordinates with the ATO to capture the test configuration of software, hardware, test data, test tools, and documentation prior to test execution to ensure repeatability. They also capture and retain test outputs (e.g., test logs, data, and modified procedures) and distribute copies for test analysis. The product baseline, which is established prior to the RRR and includes test reports, is maintained by the CMO.

ECS Maintenance & Operations (M&O) Organization: As part of acceptance testing at the test site, the government site manager assigns M&O personnel who are integrated into the test team to help execute acceptance tests. The early first-hand involvement of the site manager and his operations personnel in site acceptance testing provides the M&O Team with early visibility into each new release and hastens a smooth transition. This involvement and familiarity with ECS software in the stages before release to the user base greatly enhance the effectiveness and productivity of the M&O staff and positions a highly competent and responsive user support staff on-site at the DAACs. In addition, during the M&O phase, the ATO assists by providing benchmark tests to verify operational performance of the ECS system. The ATO provides guidance in acceptance testing during the verification of approved changes and enhancements.

ESDIS SI&T Contractor: The ESDIS Integration Contractor and the Independent Verification and Validation (IV&V) Contractor witness and monitors acceptance testing, as directed by the ESDIS SI&T, and the IV&V Contractor.

The Acceptance Test Team (ATT) consists of various personnel who assist the ATO Test Conductor during the acceptance testing phases. Listed below are the SMC role players and a brief description of their responsibilities.

SMC System Administrator: Administer and maintain all SMC office and operations support computer hosts, peripherals and workstations, including troubleshooting,

preventive and general system maintenance. Complete initial program loads for all system upgrades. Provide configuration, security and access administration.

SMC Configuration Management (CM) Administrator: Provide ECS system-wide configuration management and monitoring including collecting information describing the state of ECS resources, the network subsystem and its communications resources; exercise control and/or monitoring over the configurations, parameters and resources of the subsystems and over the information collected; store the configuration information collected and display the configuration information for reporting purposes; assist the SMC personnel in fault, performance and security management.

SMC Network Analyst: Provide performance monitoring of networks. Support and maintain the high-level network event schedule. Provide reports on all network operations functions.

SMC/EOC Maintenance Coordinator: Responsible for commercial off-the shelf (COTS) hardware and software maintenance at the SMC. Functions as the site maintenance engineers.

7.5 Acceptance Test Sequences

The acceptance testing of Release A capabilities is divided into five major scenario groups: System Management, Push, Pull, flight operations, and End-to-End. These scenario groups identify hi-level ECS functionality from a users and operations viewpoint. Each group is further sub-divided into scenarios that emulate the operations and user environment. Scenarios are further broken down into more manageable test sequences in which test cases that trace to Level-3 requirements are executed. Sections 8 through 12 describe the nature of each scenario, the test sequences within them, and their individual test cases. Table 7-4 depicts the planned test sequences at all sites, including SMC.

Table 7-4. Planned Sequence of Test Activities (1 of 5)

| Sequence | Test Case | G S F C | L a R C | E D C | S M C | E O C |
|--|---|------------------|------------------|-------------|-------------|-------------|
| 8.1.1 M&O Procedures Review and Confidence | 8.1.1.1 ECS Sites Nominal Operations Policy and Procedures Review | X | X | X | X | X |
| | 8.1.1.2 ECS Hardware and Software Configuration Items Review | X | X | X | X | X |
| 8.1.2 Start-up | 8.1.2.1 Site Startup Confidence Test | X | X | X | X | X |
| | 8.1.2.2 Site Restart Including Introduction of Previous Results | X | X | X | X | X |
| 8.1.3 Site Operations | 8.1.3.1 SMC Monitoring and Control of Managed Resources | | | | X | |
| 8.1.4 Site Shutdown/Recovery | 8.1.4.1 Emergency and Other Abnormal Shutdown | X | X | X | X | X |
| | 8.1.4.2 Recovery from Catastrophic Emergency Shutdown | X | X | X | X | X |
| | 8.1.4.3 Recovery from Abnormal Non-Catastrophic Shutdown | X | X | X | X | X |
| 8.1.5 Site Maintenance | 8.1.5.1 DAAC M&O Interfaces | X | X | X | | |
| | 8.1.5.2 Maintenance of ECS Databases | X | X | X | | |
| 8.1.6 Site Data/Metadata/ Information Management | 8.1.6.1 File Management | X | X | X | | |
| | 8.1.6.2 ECS Storage/Archive/Backup Capability | X | X | X | X | |
| 8.1.7 Facilities Interface | 8.1.7.1 SMC External Interfaces | | | | X | |
| | 8.1.7.2 EOC External Interfaces | | | | | X |
| | 8.1.7.3 GSFC DAAC External Interfaces | X | | | | |
| | 8.1.7.4 LaRC DAAC External Interfaces | | X | | | |
| | 8.1.7.5 EDC DAAC External Interfaces | | | X | | |
| | 8.1.7.6 ECS Internal Interfaces | X | X | X | X | X |
| 8.2.1 Schedule Generation | 8.2.1.1 DAAC Schedule Generation | X | X | | | |
| | 8.2.1.2 SMC Schedule Generation | | | | X | |
| 8.2.2 Schedule Adjudication | 8.2.2.1 Adjudication of ECS Site Conflicts | X | X | | | |
| | 8.2.2.2 Adjudicate Contention for Resources Between ECS Sites | | | | X | |
| 8.3.1 Enhancements | 8.3.1.1 ECS Enhancements | X | X | X | X | X |
| 8.4.1 Resource Management | 8.4.1.1 Resource Management Directive | X | X | X | X | X |
| | 8.4.1.2 Sufficient Storage | X | X | | | |
| 8.4.2 Maintenance Management | 8.4.2.1 On-site Preventive Maintenance | | | | X | |
| | 8.4.2.2 On-site Corrective Maintenance | | | | X | |
| 8.4.3 Logistics Management | 8.4.3.1 Logistics Monitoring | X | X | X | X | X |
| | 8.4.3.2 Logistics Replenishment | X | X | X | X | X |
| 8.4.4 Training Management | 8.4.4.1 ECS Training and Certification Program Management | X | X | X | X | |
| | 8.4.4.2 On-the-Job Training | | | | X | |
| 8.4.5 Inventory Management | 8.4.5.1 Inventory and Configuration Management | X | X | X | X | |
| | 8.4.5.2 LSM Enhancement Evaluation & Implementation Management | | | | X | |
| | 8.4.5.3 SMC Enhancement Evaluation & Implementation Management | | | | X | |
| 8.4.6 Quality Management | 8.4.6.1 SMC Quality Assurance | | | | X | |
| | 8.4.6.2 LSM Quality Assurance | X | X | X | | X |

Table 7-4. Planned Sequence of Test Activities (2of 5)

| Sequence | Test Case | G S F C | L a R C | E D C | S M C | E O C |
|--|---|------------------|------------------|-------------|-------------|-------------|
| 8.4.7 Policies and Procedures Management | 8.4.7.1 Policies and Procedures Control | X | X | X | X | X |
| | 8.4.7.2 Policies and Procedures Maintenance | X | X | X | | X |
| 8.4.8 Network Management | 8.4.8.1 Network Configuration and Status | X | X | X | | X |
| | 8.4.8.2 Directory Service | X | X | X | | X |
| 8.5.1 Metrics | 8.5.1.1 Performance Metrics Establishment | X | X | X | X | |
| | 8.5.1.2 Performance Measurement and Degradation Response Capability | X | X | X | X | |
| | 8.5.1.3 RMA Assurance Test and Analysis | X | X | X | X | X |
| 8.5.2 Performance, Monitoring, Analysis, and Testing | 8.5.2.1 Performance Testing | X | X | X | X | |
| | 8.5.2.2 Performance Monitoring and Analysis | X | X | X | X | X |
| 8.6.1 Fault Management | 8.6.1.1 DADS Fault Analysis and Diagnostic Testing | X | X | X | | |
| | 8.6.1.2 Product Generation Fault Analysis and Diagnostic Testing | X | | | | |
| | 8.6.1.3 Communications Fault Analysis and Diagnostics Testing | X | X | X | X | X |
| | 8.6.1.4 Push Error | X | | | | |
| 8.6.2 Security Management | 8.6.2.1 SMC Security Functions | | | | X | |
| | 8.6.2.2 LSM Security Functions | X | X | X | | X |
| 8.6.3 Accounting and Accountability | 8.6.3.1 Accountability: Data Tracking and Audit Trails | | | | X | |
| | 8.6.3.2 Accountability: LSM Data Tracking | X | X | X | | X |
| 8.6.4 Report Generation | 8.6.4.1 SMC Report Generation | | | | X | |
| | 8.6.4.2 LSM Report Generation | X | X | X | | X |
| 9.1.1 Data Ingest, Processing, and Archive at ECS/LaRC from SDPF | 9.1.1.1 CERES Data Receipt from SDPF to ECS/LaRC Test Procedure | | X | | | |
| | 9.1.1.2 CERES Data Validation/Formatting at ECS/LaRC Test Procedure | | X | | | |
| | 9.1.1.3 CERES Metadata and Level-1 through 4 Data Processing at ECS/LaRC Test Procedure | | X | | | |
| | 9.1.1.4 Archive CERES Data Products at ECS/LaRC Test Procedure | | X | | | |
| | 9.1.1.5 CERES Data Receipt from SDPF to ECS/LaRC (Fault) Test Procedure | | X | | | |
| | 9.1.1.6 CERES Data Validation/Formatting at ECS/LaRC (Fault) Test Procedure | | X | | | |
| | 9.1.1.7 CERES Metadata and Level-1 through 4 Data Processing at ECS/LaRC (Fault) Test Procedure | | X | | | |
| | 9.1.1.8 Archive CERES Data Products at ECS/LaRC (Fault) Test Procedure | | X | | | |
| | 9.1.1.9 Ingest, Validate, and Archive CERES Documentation from SDPF Test Procedure | | X | | | |
| 9.1.2 Data Ingest, Processing, and Archive at ECS/MSFC from SDPF | | | | | | |
| 9.1.3 Early AM-1 Interface Test Support | 9.1.3.1 AM-1 Data Ingest from EDOS at ECS/LaRC Test Procedure | | X | | | |
| | 9.1.3.2 AM-1 Data Ingest from EDOS at ECS/GSFC Test Procedure | X | | | | |
| | 9.1.3.3 AM-1 Data Ingest from EDOS at EDC Test Procedure | | | X | | |

Table 7-4. Planned Sequence of Test Activities (3 of 5)

| Sequence | Test Case | G S F C | L a R C | E D C | S M C | E O C |
|--|---|------------------|------------------|-------------|-------------|-------------|
| 9.1.4 Early FDF and AM-1 Interface Test Support | 9.1.4.1 Orbit/Attitude Data Ingest from FDF | X | | | | |
| 9.2.1 Higher Level Processed Data Receipt from the V0 DAAC | 9.2.1.1 Ingest, Validate, and Archive Migration Version 0 Data from the V0 DAAC | X | X | X | | |
| | 9.2.1.2 Ingest, Validate, and Archive TOMS Ozone Ancillary Data from the V0 DAAC | X | | | | |
| | 9.2.1.3 Ingest, Validate, and Archive Migration Version 0 Documentation from the V0 DAAC | X | X | X | | |
| | 9.2.1.4 Ingest, Validate, and Archive SAGE II Ancillary Data from the V0 DAAC | | X | | | |
| 9.2.2 Higher Level Processed Data Receipt from the TSDIS to the MSFC DAAC | | | | | | |
| 9.2.3 Higher Level Processed Data Receipt from the TSDIS to the GSFC DAAC | 9.2.3.1 Ingest, Validate, Process, and Archive VIRS Data from TSDIS | X | | | | |
| | 9.2.3.2 Ingest, Validate, and Archive VIRS, PR, TMI, and GV Documentation from TSDIS | X | | | | |
| | 9.2.3.3 Ingest, Validate, and Archive VIRS, PR, TMI, and GV Data from TSDIS (Fault) | X | | | | |
| 9.2.4 Higher Level Processed Data Receipt from EPDS (Landsat-7) | 9.2.4.1 Science Planning Information | | | X | | |
| | 9.2.4.2 Ingest Data/Metadata from Landsat-7 | | | X | | |
| 9.2.5 Higher Level Processed Data Receipt from the NOAA ADC to the LaRC DAAC | 9.2.5.1 Ingest, Validate, and Archive NOAA ADC Ancillary Data at the LaRC DAAC | | X | | | |
| 9.2.6 Higher Level Processed Data Receipt from the NOAA ADC to the GSFC DAAC | 9.2.6.1 Ingest, Validate, and Archive NOAA ADC Ancillary Data | X | | | | |
| 9.3.1 Reprocessing Request Receipt/Processing from the SCF (LaRC) | 9.3.1.1 SCF Reprocessing Requests Receipt/Validation at the LaRC DAAC Test Procedure | | X | | | |
| | 9.3.1.2 SCF Reprocessing Plan Generation/Dispatching at the LaRC DAAC Test Procedure | | X | | | |
| | 9.3.1.3 CERES Standard and Browse Data Products Reprocessing at the LaRC DAAC Test Procedure | | X | | | |
| | 9.3.1.4 CERES Standard and Browse Data Products QA Assessment Metadata Receipt/Processing at the LaRC DAAC Test Procedure | | X | | | |
| | 9.3.1.5 Reprocessed CERES Data Directories/Inventories Update and Notification Test Procedure | | X | | | |
| 9.3.2 Reprocessing Request Receipt/Processing from the SCF (MSFC) | | | | | | |
| 9.4.1 Archived TRMM Data Delivery | 9.4.1.1 TSDIS Data Requests Receipt/Validation at the MSFC DAAC | | | | | |
| | 9.4.1.2 Deliver Archived TRMM Data to the TSDIS from the MSFC DAAC | | | | | |
| | 9.4.1.3 GSFC DAAC Data Requests Receipt, Validation, and Deliver Archived TRMM Data to the TSDIS | X | | | | |
| | 9.4.1.4 Deliver Archived TRMM Data to the TSDIS from the GSFC DAAC | X | | | | |
| 9.4.2 Reprocessed Data Receipt from the TSDIS (MSFC) | | | | | | |

Table 7-4. Planned Sequence of Test Activities (4 of 5)

| Sequence | Test Case | G S F C | L a R C | E D C | S M C | E O C |
|---|---|------------------|------------------|-------------|-------------|-------------|
| 9.4.3 Reprocessed Data Receipt from the TSDIS (GSFC) | 9.4.3.1 Reprocessed Data Receipt at the GSFC DAAC from TSDIS | X | | | | |
| 9.5.3 Maintain Processing Plan and Schedules | 9.5.3.2 Maintain SMC Processing Plans and Schedules | X | X | X | | |
| 10.1.1 ECS Desktop User | 10.1.1.1 System Access via Network Link | X | X | | | |
| | 10.1.1.2 System Access via Direct Connection | X | X | | | |
| | 10.1.1.3 User Registration | X | X | | | |
| | 10.1.1.4 User Profile | X | X | | | |
| | 10.1.1.5 Data Access Privileges (DELETED) | X | X | | | |
| | 10.1.1.6 Directory Search | X | X | | | |
| | 10.1.1.7 Guide Search | X | X | | | |
| | 10.1.1.8 Inventory Search | X | X | | | |
| | 10.1.1.9 Browse | X | X | | | |
| | 10.1.1.10 Information Search | X | X | | | |
| | 10.1.1.11 Product Order | X | X | | | |
| | 10.1.1.12 Distribution Medium | X | X | | | |
| | 10.1.1.13 Application Programming Interfaces (MOVED) | | | | | |
| | 10.1.1.14 Data Product History (DELETED) | | | | | |
| | 10.1.1.15 User Statistics Report Generation | X | X | | | |
| 10.1.2 ECS/Version 0 (V0) System Interoperability | 10.1.2.1 ECS User Access to Version 0 | X | X | X | | |
| | 10.1.2.2 Search ECS & V0 from the ECS Desktop | X | X | | | |
| | 10.1.2.3 Version 0 User Access to ECS | X | X | | | |
| | 10.1.2.4 Search ECS & V0 from the V0 Client | X | X | | | |
| 10.1.3 EOSDIS Core System (ECS)/Affiliated Data Center (ADC) Interoperability | 10.1.3.1 ECS User Access to NOAA ADC | X | X | | | |
| | 10.1.3.2 ECS User Access Request NOAA ADC Product | X | X | | | |
| | 10.1.3.3 Product Status Request | X | X | | | |
| | 10.1.3.4 ECS User Search | X | X | | | |
| | 10.1.3.5 ECS User Access & Search of MSFC SCF Products | X | | | | |
| 10.2.1 GSFC SCF/ECS | 10.2.1.1 Algorithm Integration and Test at the GSFC DAAC | X | | | | |
| | 10.2.1.2 Product QA at the GSFC DAAC | X | | | | |
| | 10.2.1.3 Search, Browse, Request, and Receive Data at the GSFC DAAC | X | | | | |
| | 10.2.1.4 Data Management Services at the GSFC DAAC | X | | | | |
| | 10.2.1.5 Toolkit Testing at the GSFC DAAC | X | | | | |
| 10.2.2 LaRC SCF/ECS | 10.2.2.1 Algorithm Integration and Test at the LaRC DAAC | | X | | | |
| | 10.2.2.2 Product QA at the LaRC DAAC | | X | | | |
| | 10.2.2.3 Search, Browse, Request, and Receive Data at the LaRC DAAC | | X | | | |
| | 10.2.2.4 Data Management Services at the LaRC DAAC | | X | | | |
| | 10.2.2.5 Toolkit Testing at the LaRC DAAC | | X | | | |

Table 7-4. Planned Sequence of Test Activities (5 of 5)

| Sequence | Test Case | G S F C | L a R C | E D C | S M C | E O C |
|---|---|------------------|------------------|-------------|-------------|-------------|
| 11.1.1 EOC Tests | | | | | | |
| 12.1.1 Inter-Site Message | 12.1.1.1 Inter-DAAC and DAAC-SMC Communications | X | X | X | X | X |
| 12.1.2 Multi-Site System Management | 12.1.2.1 Schedule Generation, Coordination and Adjudication Support | X | X | | X | |
| | 12.1.2.2 TRMM and AM- 1 Resource Scheduling Support | X | X | | X | |
| | 12.1.2.3 SMC Support to Integration Test & Simulation Activities | | | | X | |
| 12.2.1 SDPF Data Handling and Processing | 12.2.1.1 Retrieve CERES Data from SDPF, Process and Archive Standard CERES' Products at LaRC DAAC | | X | | | |
| 12.2.2 TSDIS Data Handling | 12.2.2.1 VIRS, PR, TMI, and GV Data Ingest and Store | X | | | | |
| 12.2.3 TRMM Data Product Distribution | 12.2.3.1 TRMM Data Product Distribution | X | X | | | |
| 12.2.4 Data Accounting | 12.2.4.1 Data Product/Data Receipt Accounting | X | X | | | |
| | | | | | | |
| 12.4.1 Science Data Search and Retrieval | 12.4.1.1 Multi-Site Data Search and Access | X | X | | | |
| | 12.4.1.2 Data Receipt and Data Storage | X | X | | | |
| | 12.4.1.3 Science Ancillary Data Access | X | X | | | |
| 12.4.2 Science Data Product Production | 12.4.2.1 Science Algorithm Retrieval and Compatibility | X | X | | | |
| 12.4.3 Science Metadata Production and Storage | 12.4.3.1 Metadata Production and Updating | X | X | | | |
| | 12.4.3.2 Metadata Storage and Retrieval | X | X | | | |
| 12.4.4 ECS Data Set Interoperability | 12.4.4.1 ECS DAAC and V0 DAAC Interoperability | X | X | X | | |
| | 12.4.4.2 NOAA Data Centers/ECS DAAC Interoperability | X | X | | | |
| 12.5.1 Data Ingest, Data Server and Data Distribution Performance | 12.5.1.1 High Data Rate Ingest, Archiving and Retrieval | X | X | | | |
| | 12.5.1.2 Ingest and Archiving of Triple the Average Data Rates | X | X | | | |
| | 12.5.1.3 GSFC DAAC Data Reprocessing Support and Archiving | X | | | | |
| | 12.5.1.4 LaRC DAAC Data Reprocessing Support and Archiving | | X | | | |
| 12.5.2 System Response Time Performance | 12.5.2.1 Client Server Response Time Performance | X | X | | | |
| | 12.5.2.2 Data Access Retrieval and Transmission Performance | X | X | | | |
| 12.5.3 ECS Sizing, Evolution, and Growth | 12.5.3.1 Accommodation of ECS Expansion Analysis | X | X | X | | |
| | 12.5.3.2 ECS Growth and Evolution Adequacy Analyses | X | X | X | X | X |
| 12.5.4 ECS Testability and Overall Capabilities | 12.5.4.1 Test Support in an Operational DAAC | X | X | | | |

7.5.1 SMC Test Procedure Roadmap

This section provides a listing of tables from the Appendices to this document, that cross reference test sequences or procedures to each of the following:

External Interfaces (Appendix A) - The left column of this table lists each interface external to the Release A ECS SMC. In the right column is a list of test sequences which contains tests involving that external interface.

Operational Scenarios (Appendix B) - This table lists each of the operations scenarios from the Operations Scenarios for the ECS Project: Release A (DID 605) in the left column, and in the right column a list of test sequences which contains tests which use that scenario as part of the procedure(s) in that sequence.

M&O Procedures (DID 611) (Appendix C) - This table lists each of the maintenance procedures from the Maintenance and Operations Procedures (DID 611) in the left column, and in the right column a list of test procedures which use that procedure.

(Note: This table was requested by GSFC V0 DAAC. It will be filled in as the information becomes available.)

SMC H/W (Appendix D) - This table lists each piece of hardware at the Release A ECS SMC in the left column, and in the right column a list of test procedures which use that hardware as part of the procedure(s).

(Note: This table was requested by GSFC V0 DAAC. It will be filled in as the information becomes available)

7.6 Test Conduct

Test conduct is the execution of the approved test procedures in the officially approved and controlled test configuration. ATO test conduct takes place at the SMC on a fully approved and configured release baseline as approved at the CSR.

7.6.1 Test Direction

All formal tests are conducted under the direction of the Test Conductor who has direct authority regarding all aspects of the execution of that test. This authority includes the assignment of priority to NCRs, NCR disposition, and the NCR's impact on ongoing testing. The step-by-step details of non-conformance reporting and software configuration management is described in the Software Nonconformance Reporting and Corrective Action System Process Project Instruction (SD-1-014) and the Software Development Handbook Project Instruction (CM-1-025).

Authority is vested in the Test Conductor by the Project or Release Manager, but may be further delegated at specific times (off-shift) and/or sites or during his absence. Where activities involve more than one site, this delegation of authority is key. The local test conductor needs autonomy, but also needs centralized guidance. For further information concerning duties of other test participants, see the Verification Plan (DID 401/VE1).

7.6.2 Test Schedule Management

The Test Conductor is responsible for the scheduling and dispatch of test resources and activities. In consultation with concerned parties, he/she determines what portion of the test is executed on a given day. During this process all pertinent factors are examined: availability of system resources, conflicts with other activities and inherent test sequencing concerns. During the planning and preparation phases the overall verification activity was divided into scenarios and sequences to provide flexibility in scheduling. The sequences comprising a scenario provide a manageable increment of the test with clear starting and stopping points. The test procedure is the most basic increment of execution. It is crucial that the Test Conductor be cognizant of dependencies within the test structure (e.g., does the current procedure require that another procedure has run successfully to establish initial data conditions?). These are documented in the test procedure itself, but the Test Conductor must have broader understanding and control of the test environment at all times to deal effectively with test scheduling issues.

When a given test procedure is scheduled for execution, the Test Conductor ensures that all necessary materials and supporting data are present. Included and key to this activity are copies of the applicable procedures, either hard copy or access to on-line soft copy. Specially labeled copies of the procedures are distributed to each participant actually performing the test. Observers receive copies so they may follow the execution. The copies of the test procedures held by those performing the test and the Test Conductor's copy is collected and becomes part of the official record of the test. As such, on the day of the test they are marked, by hand, to indicate date, time, operator position (or role) and who is using the procedure.

Before the beginning of a scheduled test period a pre-test meeting is held by the Test Conductor. The Test Conductor determines the need for both regularly scheduled and Ad Hoc meetings. The purpose of the pre-test meetings is to:

- a. Brief the activities to be performed
- b. Assess readiness to proceed with those activities
- c. Discuss any special conditions for the conduct of the activity
- d. Apply any last minute markups to the test procedures to be used. If there are any, they are made, initialed and dated.

All changes to test procedures, either during planning, execution or post test analysis, are approved and initialed by the Test Conductor. Changes to test procedures are either temporary or permanent. Temporary changes are those that are made to accommodate a singular event or circumstance. Temporary changes generally apply to only one execution of the test procedure and are made to document the deviation for reporting purposes. For temporary changes the procedures are marked up in blue or black ink. Permanent procedure changes are made to correct errors in the procedures or insert new steps which are executed every time the test is re-run. Permanent changes are marked up in red ink and are reflected in the next document release which contains that particular test procedure.

7.6.3 Test Execution

The test begins under the control of the Test Conductor or a designated authority. Team participants follow, exactly, the instructions written in the procedures. In some cases these procedures have an inherent timeline that is critical to the success of the activity. In these cases the procedures have, for each step or group of steps, a time tag telling when they should be performed. The Test Conductor coordinates the pacing of these steps by providing synchronized time sources to all participants. In other cases, the procedures have self-contained pacing instructions. These may instruct the test participant to wait until directed to proceed with a given activity.

The test procedures specify what data is to be collected as the test is executed. This may include spaces where data is to be entered into the procedure itself to capture results or to record the time it took to perform a given activity. All entries requested must be entered in blue or black ink.

7.6.4 Unscheduled Events During Test Execution

Problems encountered which interrupt or prevent the execution of the test procedures might include the following:

- a. Failure of the system to perform as specified in the procedure.
- b. Inability to perform the next step due to, for instance, missing data. An example is: "Select an ASTER image dated 9/11/98".
- c. Critical software failure.
- d. Hardware, communications, or special test equipment failure.
- e. An error in following the procedure. Steps might be inadvertently skipped. This may be noticed by the operator or might cause a more overt problem already listed above.
- f. Unexpected actions by others that affect the test environment.

It is the responsibility of the test participants to determine if problems have occurred. If there is doubt, they immediately address their concerns to the Test Conductor. The Test Conductor is, likewise, responsible to carefully follow the conduct of the test constantly, looking for deviations or anomalies. Actions to be taken in response to unscheduled events are detailed in the Procedure for Control of Unscheduled Activities During Verification for the ECS Project (DID 404/VE1).

7.6.5 Test Conduct Documentation

As the test proceeds, significant events are recorded in test logs. Each test team participant keeps a log. The Test Conductor keeps a master test log which include the information recorded in the individual logs.

Upon completion of a session of testing, the Test Conductor directs the securing of all necessary information. Material to be collected/controlled includes:

- a. All test procedures (including markups)
- b. Test Logs (including individual logs and notes and the master test log)
- c. Materials produced by the system under test (e.g. printouts, screen dumps)
- d. Post test file dumps. This may involve collection of actual media to perform the saves. If instead, the dumps are recorded on disk, they should be placed under CM control by saving them within the ClearCase tool. In this case, a record of the data set names and version must be maintained.
- e. NCRs written during the testing period. Note: Some problems encountered are obvious NCRs and can be written immediately. Other problems are discussed at the post test review meeting described below. ECS policy is to write NCRs freely and dispose of duplicates or erroneous submissions after review.

7.6.6 Daily Test Reviews

At the completion of each day of testing, a post test review meeting is held to review the events of the day. If testing involves simultaneous activities at multiple sites, as in the end-to-end scenarios, this post test review meeting is held as a teleconference. During this meeting, overall testing status is assessed. Problems encountered during the day are reviewed. This is accomplished by reviewing all test procedures and test logs. Each problem is discussed and assessed. A determination of the need to create a Nonconformance Report is made. If an NCR is opened, a team member is assigned to enter it in the NRCA system. The status and priority of the problem is determined, if possible. Any necessary follow-up investigation is assigned, including imposition of a due date. A daily log of statistics is kept citing the number of test cases executed, number of Nonconformance Reports filed, their classification and other test metrics for status reporting purposes. Specific metrics relating to test execution are developed, reviewed, and approved prior to the start of test conduct activities.

Finally, a determination of success for the day's activities is made and discussed. This guides the planning for the next session's activities. Based on this assessment, any changes in the scheduled activities for the next day is evaluated and the test schedules and procedures updated appropriately. Generally, complete success in meeting the objectives for a day's testing results in the uninterrupted continuation of the planned test activities. Unexpected interruptions to testing results in the rescheduling of test activities and resources to minimize the impact to the testing effort.

7.7 Acceptance Test Schedule

Figure 7-6 depicts the acceptance test schedule for the ECS Release A. During the conduct of acceptance testing, ATO conducts a daily acceptance test status meeting to apprise EDC management personnel of on-going acceptance test schedules and status.

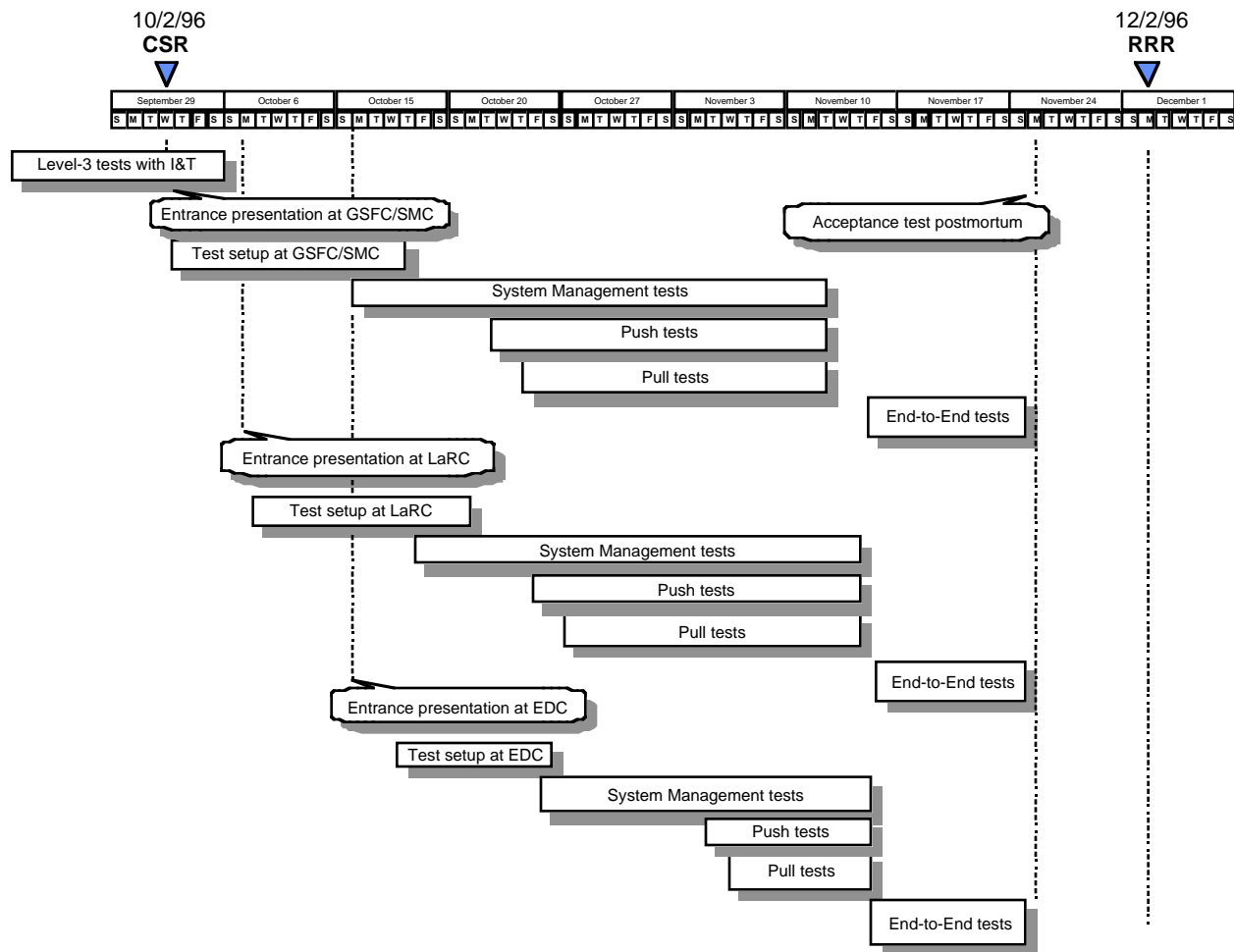


Figure 7-6. Acceptance Test Schedule

7.8 Release Readiness Review (RRR)

Before ECS Release A is formally approved for use, a RRR is held to validate the utility and suitability of the release. This review focuses on the degree to which requirements for Release A have been satisfied. The current status of interfacing elements and the user support infrastructure within the ECS is reviewed to ensure that Release A actually improves overall system operation. In addition to a summary of new capabilities and changes since the Ir1 release, the data products scheduled in the ECS CDRL for delivery prior to the RRR, shown in Figure 7-7, are available for review.

The results of the Physical Configuration Audits (PCAs), conducted at each applicable operational site, are presented at RRR. Witnessed by the Quality Office and ESDIS, the PCAs are conducted by the ECS Project Team and led by the CMO. The results of the Functional Configuration Audits (FCAs), accomplished by review of Acceptance Test results, are presented at RRR. The FCA's are performed by the Quality Office and ESDIS. Both PCA and FCA results are documented and delivered in CDRL 081, Audit Report (DID 506/PA3).

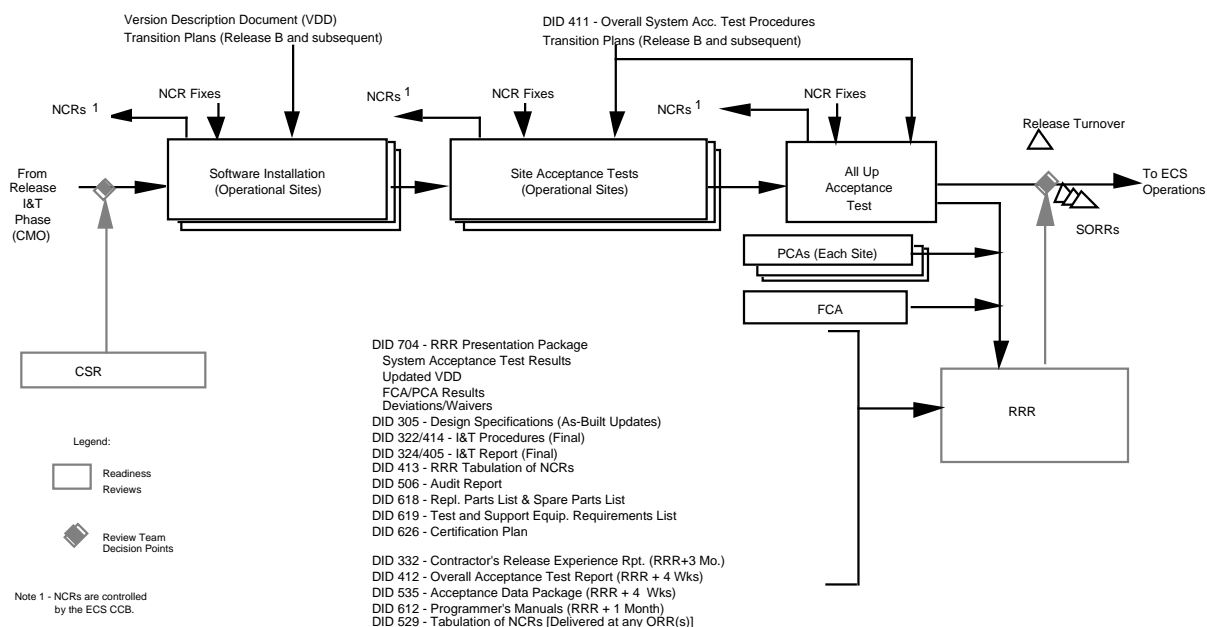


Figure 7-7. Release Readiness Review Material

8. System Management Scenario Group

The objective of the System Management Scenario Group is to demonstrate the ability of ECS system facilities and infrastructure to perform ongoing operations at the levels required for ECS Release A. The site is examined to provide assurance to the AT team of its readiness to support further acceptance testing, based on its performance under the scrutiny of the ECS Site Commission Scenario. The SMC conducts enterprise monitoring and coordination of operations for ECS managed resources. SMC interfaces with the LSMs to perform system-resource, network and inventory management. These interfaces provide the site management access to SMC management services and system wide data. The system level scheduling and performance management capability is evaluated. Ancillary capabilities (fault management, security functionality, accounting and accountability, and report generation) are reviewed for functional completeness and for acceptable operation at the site, and in the total ECS system context.

8.1 ECS Site Commission Scenario

This scenario verifies the SMC procedures and the operation and care of SMC equipment. The scenario includes an evaluation of SMC documented procedures, a demonstration of how the SMC is "powered up", how various start-up and shutdown procedures are done, and how recovery from an abnormal shutdown is accomplished. It also demonstrates the types and availability of SMC maintenance tools and the application of approved procedures for their use. Assessment of the SMC facility interface capability includes evaluation of both external and internal interfaces.

Through a demonstration of simulated events and a policy and procedures review, confidence is built in the SMC's ability to successfully respond to scheduled and unscheduled events. As a final step, the AT team estimates the site's readiness to support further acceptance testing, based on the site's performance during this condensed, comprehensive overview of the systems operation.

8.1.1 M&O Procedures Review and Confidence Test Sequence

This sequence confirms the existence and completeness of documented M&O policies and procedures and confirms the correct hardware and software configuration items of the SMC ECS site.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): There are no external interfaces needed for this sequence.

Operator Position(s): The operator position from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support this sequence is listed:

SMC Computer Operator

Operational Scenario(s): There are no scenarios, taken from the Operations Scenarios for the ECS Project: Release-A (DID 605/OP2), used during this sequence of tests.

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.1.1.1 ECS Sites Nominal Operations Policy and Procedures Review

| | | |
|--|---|------------------------|
| TEST Procedure No. A080110.010\$\$ | Date Executed: | Test Conductor: |
| Title: ECS Sites Nominal Operations Policy and Procedures Review | | |
| Objective: This test verifies the existence, accessibility and usability of documented operational and maintenance policies and procedures. | | |
| Requirements | Acceptance Criteria | |
| SMC-2600#A | The requirement is verified through inspection. The SMC shall support, control, and maintain ECS policies and procedures covering the following areas, at a minimum: a. Site or element responsibility and authority b. Resource management c. Fault recovery d. Testing e. Simulation f. Maintenance g. Logistics h. Performance evaluation i. Training j. Quality and product assurance k. Inventory management l. System enhancements m. Finance management n. Administrative actions o. Security The documented SMC MSS policies and procedures for the SMC ECS must be available for use at the SMC site. | |
| Test Inputs: <u>Release A Version Description Document</u> (DID 814) <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3) | | |

| Step-By-Step Procedures | | |
|--|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Tester: Confirms that configuration management has verified the <u>Release A Version Description Document</u> (DID 814) includes the following document: <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3) | |
| 20 | Expected Result: Certified DID 611/OP3 is included in <u>Release A Version Description Document</u> (DID 814). | |
| 30 | Tester: Inspects <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3) to verify that the following items are addressed: a. Site or element responsibility and authority b. Resource management c. Fault recovery d. Testing e. Simulation (TBD) f. Maintenance g. Logistics h. Performance evaluation i. Training j. Quality and product assurance k. Inventory management l. System enhancements m. Finance management n. Administrative actions o. Security | |
| 40 | Expected Result: The following items are addressed in <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3): a. Site or element responsibility and authority b. Resource management c. Fault recovery d. Testing e. Simulation - TBD f. Maintenance g. Logistics h. Performance evaluation i. Training j. Quality and product assurance k. Inventory management l. System enhancements m. Finance management n. Administrative actions o. Security | |
| Data Reduction and Analysis Steps: The document <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3) is inspected and SMC policies and procedures are verified. | | |
| Signature: | | Date: |

8.1.1.2 ECS Hardware and Software Configuration Items Review

| | | |
|---|---|------------------------|
| TEST Procedure No.: A080110.020\$\$ | Date Executed: | Test Conductor: |
| Title: | ECS Hardware and Software Configuration Items Review | |
| Objective: | This test verifies the SMC ECS hardware and software configuration items are on the system. | |
| Requirements | Acceptance Criteria | |
| SMC-2510#A | This requirement is verified through test. (RTM: analysis) The SMC shall provide at a minimum system-wide configuration management for the operational hardware, scientific and system software, and the SMC toolkit contained within ECS. The management system shall support the migration of hardware and software upgrades into the operational environment. It will be verified that the Baseline Manager contains a version history of configuration controlled resources according to each site's operational baseline as described in the <u>Release A Version Description Document</u> (DID 814) | |
| Test Inputs: <u>Release A Version Description Document</u> (DID 814) | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Tester: Confirms that configuration management has verified the <u>Release A Version Description Document</u> (DID 814) includes all the SMC hardware and software configuration items configured into the system. | |
| 20 | Expected Results: Configuration management personnel certify that the <u>Release A Version Description Document</u> (DID 814) contains all the SMC hardware and software configuration items configured into the SMC ECS system. | |
| 30 | Computer Operator: Log into the MSS Enterprise Management Server and execute the Baseline Manager application. | |
| 40 | Expected Results: Baseline Manager application displays on the screen. | |
| 50 | Computer Operator: Using the list of hardware and software configuration items listed in the <u>Release A Version Description Document</u> (DID 814), access and view each configuration item stored within the Baseline Manager. | |
| 60 | Expected Results: Each of the configuration items listed in the <u>Release A Version Description Document</u> (DID 814) contains <ul style="list-style-type: none"> a. the current version; b. the current version's specifications and technical, operations, and maintenance documentation; c. the specification and technical documentation history; d. the "level of assembly" representation of the components; and e. the version history. | |
| 70 | Computer Operator: Exit the Baseline Manager. | |
| 80 | Expected Results: The screen returns to the UNIX prompt. | |
| Data Reduction and Analysis Steps: | | |
| The software and hardware configuration items listed in <u>Release A Version Description Document</u> (DID 814) are verified against those of the Baseline Manager. | | |
| Signature: | | Date: |

8.1.2 Site Startup Sequence

This sequence verifies that the SMC ECS can be powered up using normal cold-start procedures, operated successfully for fifteen minutes (or less if approved by the AT test manager) and shut down using normal procedures. The SMC ECS is subsequently restarted to verify the system's ability to perform normal "warm restart" procedures.

During the fifteen minutes of operational time, specific configuration changes are input to the system. After normal shutdown and restart, the observed system configuration is compared to the configuration prior to shutdown to verify the preservation of system configuration parameters.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): There are no external interfaces needed for this sequence.

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Computer Operator

SMC System Administrator

SMC Resource Controller

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

ECS System Shutdown/Startup Scenario (Section 3.1.1)

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.1.2.1 Site Startup Confidence

| | | | | | |
|--|--|---|--|------------------------|--|
| TEST Procedure No.: A080110.040\$\$ | | Date Executed: | | Test Conductor: | |
| Title: | | Site Startup Confidence | | | |
| Objective: | | The purpose of this test is to demonstrate a normal startup, operations and shutdown of the SMC ECS site. | | | |
| Requirements | | Acceptance Criteria | | | |
| EOSD3000#A | | This requirement is verified through demonstration. The ECS shall provide for security safeguards to cover unscheduled system shutdown (aborts) and subsequent restarts, as well as for scheduled system shutdown and operational startup. System startup and shutdown must be accomplished using the cold startup and normal shutdown procedures documented in the <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3). Part of the requirement, “unscheduled system shutdown (aborts) and subsequent restarts”, is not verified in this procedure and will be verified in 8.1.4 Site Shutdown/Recovery Sequence. | | | |
| Test Inputs: Mission Operation Procedures for the ECS Project (DID 611/OP3) | | | | | |
| Data Set Name | | Data Set ID | | File Name | |
| Description | | Version | | | |
| N/A | | | | | |

| Step-By-Step Procedures | | |
|-------------------------|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | Perform an ECS cold startup procedures in accordance with the Mission Operation Procedures for the ECS Project(DID 611/OP3). | |
| 10 | System Administrator: Initializes the script to cold startup the ECS system. | |
| 20 | Expected Result: 1. Executes the Startup Script 2. MSS Agent is initialized 3. MSS Agent calls the CSS Subsystem startup script 4. CSS Subsystem software is started 5. MSS Agent calls the ISS Subsystem startup script 6. ISS Subsystem software is started 7. MSS Agent opens the Gateway to allow for incoming requests | |
| 25 | System Administrator: Initializes HP OpenView. | |
| 27 | Expected Result: HP OpenView displays on the screen. | |
| 30 | System Administrator: Using the HP Open View Network Node Manager, examines the status of all devices within each submap. | |
| 40 | Expected Result: All devices, represented by icon symbols, are green. | |
| 50 | System Administrator: Using the system management agent, configures the display to monitor a specific set of software and hardware elements. | |
| 55 | Expected Result: HP OpenView displays the specific set of elements. | |
| 60 | System Administrator: Saves the configuration. | |
| 70 | Expected Results: The system management agent saves the new display configuration. | |
| 80 | System Administrator: Sends out a message to all Computer Operators and the Resource Controller notifying them that the system is up and running. | |
| 90 | Expected Result: A pop up message, THE ECS HAS BEEN STARTED AND IS OPERATIONAL, is displayed on the Computer Operator's and Resource Controller's screens. | |
| 95 | System Administrator: Monitors the system for 15 minutes. | |
| 97 | Expected Result: HP OpenView shows that each of the subsystems are up and running without any problems. This is conveyed by HP OpenView by a green icon representing each of the components. | |
| | Perform an ECS normal shutdown procedures in accordance with the Mission Operation Procedures for the ECS Project(DID 611/OP3). | |

| | | |
|---|---|--------------|
| 100 | System Administrator: Sends out a notice to all Computer Operators and Resource Controller that the system will be shutting down in T-30 minutes. | |
| 110 | Expected Result: A pop up message - "The ECS will be shutting down in 30 minutes. The scheduled shutdown is at hhmm" is displayed on the Computer Operators' and Resource Controller's screens. | |
| 120 | System Administrator: Sends out a notice to all Computer Operators and Resource Controller that the system will be shutting down in T-15 minutes. | |
| 130 | Expected Result: A pop up message - "The ECS will be shutting down in 15 minutes. The scheduled shutdown is at hhmm" is displayed on the Computer Operators' and Resource Controller's screens. | |
| 140 | System Administrator: Sends out a notice to all Computer Operators and Resource Controller that the system will be shutting down in T-1 minute. | |
| 150 | Expected Result: A pop up message - "The ECS will be shutting down in 1 minute. The scheduled shutdown is at hhmm" is displayed on the Computer Operators' and Resource Controller's screens. At Shutdown system no longer allows incoming requests. | |
| 160 | System Administrator: Waits for all jobs to complete. If a job running will take longer than 10 minutes to complete, the job will be notified. Executes a OPSO command to verify that all processes have completed. | |
| 170 | Expected Result: System completes all jobs. | |
| 180 | System Administrator: Shuts down the ISS Subsystem. | |
| 190 | Expected Result: System shuts down ISS Subsystem. | |
| 200 | System Administrator: Monitors HP OpenView to see when the ISS Subsystem has shut down. | |
| 210 | Expected Result: ISS Subsystem icon turns red on HP OpenView. | |
| 220 | System Administrator: Shuts down the CSS Subsystem. | |
| 230 | Expected Result: System shuts down CSS Subsystem. | |
| 240 | System Administrator: Monitors HP OpenView to see when the CSS Subsystem has shut down. | |
| 250 | Expected Result: CSS icon turns red on HP OpenView. | |
| 260 | System Administrator: Shuts down the MSS Subsystem. | |
| 270 | Expected Result: System shuts down MSS Subsystem. | |
| 280 | System Administrator: Monitors HP OpenView to see when the MSS Subsystem has shut down. | |
| 290 | Expected Result: MSS Subsystem icon turns red on HP OpenView. UNIX prompt appears. | |
| Data Reduction and Analysis Steps: | | |
| None | | |
| Signature: | | Date: |

8.1.2.2 Site Restart Including Introduction of Previous Results

| | | | | |
|--|-----------------------|---|------------------------|----------------|
| TEST Procedure No.: A080120.010\$\$ | Date Executed: | | Test Conductor: | |
| Title: Site Restart Including Introduction of Previous Results | | | | |
| Objective: This test demonstrates the ability of the ECS to perform a warm restart and demonstrates that configuration inputs from the prior operational state are still active following a shutdown and restart process. | | | | |
| Requirements | | Acceptance Criteria | | |
| EOSD3000#A | | <p>This requirement is verified through demonstration.</p> <p>The ECS shall provide for security safeguards to cover unscheduled system shutdown (aborts) and subsequent restarts, as well as for scheduled system shutdown and operational startup.</p> <p>The ECS must perform a warm restart and demonstrate the return to the preserved configuration from the previous operational state.</p> <p>Parts of the requirements, “unscheduled system shutdown (aborts) and subsequent restarts” and “scheduled system shutdown” are not verified in this procedure. They are verified in 8.1.4 Site Shutdown/Recovery Sequence and 8.1.2.1 Site Startup Confidence Test respectively.</p> | | |
| Test Inputs: Mission Operation Procedures for the ECS Project(DID 611/OP3) | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| N/A | | | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | <u>Perform an ECS warm restart in accordance with procedures documented in the Mission Operation Procedures for the ECS Project(611/OP3).</u> | |
| 10 | System Administrator: Initializes the script to warm startup the ECS system. | |
| 20 | Expected Result: 1. Executes the Startup Script. 2. MSS Agent is initialized. 3. MSS Agent calls the CSS Subsystem startup script. 4. CSS Subsystem software is started. 5. MSS Agent calls the ISS Subsystem startup script. 6. ISS Subsystem software is started. 7. MSS Agent opens the Gateway to allow for incoming requests. | |
| 30 | System Administrator: Initializes HP OpenView. | |
| 40 | Expected Result: HP OpenView displays on the screen. | |
| 50 | System Administrator: Verify that the display configuration of test 8.1.2.1, step 70 appears on the screen. | |
| 60 | Expected Result: Information is displayed on the screen per the configuration entered in test 8.1.2.1, step 70. | |
| 70 | System Administrator: Sends out a message to all Computer Operators and the Resource Controller notifying them that the system is up and running. | |
| 80 | Expected Result: A pop up message - The ECS HAS BEEN STARTED AND IS OPERATIONAL is displayed on the Computer Operators' and Resource Controller's screens. | |
| 90 | System Administrator: Monitors the system for 15 minutes. | |
| 100 | Expected Result: HP OpenView shows that the elements configured in step 60 are up and running without any problems. This is conveyed by the OpenView by a green icon representing each of the components. | |
| Data Reduction and Analysis Steps: None | | |
| Signature: | | Date: |

8.1.3 Site Operations Sequence

This sequence provides assurance of the SMC operations capability to provide application programming interfaces (APIs) for monitoring and control of managed resources.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): The external Interfaces (i.e. other ECS sites and data sources) needed for a sequence (both real and simulated) are listed:

EOC

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed.

DAAC Production Monitor

SMC Computer Operator

SMC Performance Analyst

Operational Scenario(s): There are no operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A (DID 605/OP2), used during this sequence of tests.

Test Dependencies: The following table identifies the test procedures in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|---------------------|------------|
| A080130.010\$\$ | EOC/A080640.030\$F | Prior |
| | GSFC/A080640.030\$G | Prior |
| | LaRC/A080640.030\$L | Prior |
| | EDC/A080640.030\$E | Prior |
| | GSFC/A100230.020\$G | Concurrent |

8.1.3.1 SMC/LSM Monitoring and Control of Managed Resources

| | | |
|--|--|-----------------|
| TEST Procedure No.: A080130.010\$\$ | Date Executed: | Test Conductor: |
| Title: | SMC/LSM Monitoring and Control of Managed Resources | |
| Objective: | This test verifies the ability of the SMC to provide application programming interfaces (APIs) for monitoring and control of management data | |
| Requirements | Acceptance Criteria | |
| SMC-1000#A | <p>This requirement is verified through test.</p> <p>The SMC shall provide application programming interfaces (APIs) for the monitoring and control of managed resources. These APIs shall provide mechanisms for:</p> <ul style="list-style-type: none">a. Capturing, by an application, of management datab. Exchanging management data between a managed application and its management agentc. Exchanging management data between a management agent and the LSMd. Performing analyses and generating reports using management data <p>A DAAC site host will be brought up running managed applications, their management agent and the LSM. Operation staff will use the LSM user interface to request management data display and reports regarding the managed applications. All the requested information must be correctly displayed and/or printed.</p> | |
| Test Inputs: None | | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Computer Operator: Powers on the system computers. | |
| 20 | Expected Result: System components respond; power on indicator lights all illuminated. | |
| 30 | SMC Computer Operator: Executes the system startup script according to the <u>Mission Operation Procedures for the ECS Project(DID 611/OP3)</u> . | |
| 40 | Expected Result: All SMC subsystems are started. | |
| 50 | SMC Performance Analyst: Initializes HP OpenView. | |
| 60 | Expected Result: OpenView map display appears on the screen. | |
| 70 | SMC Computer Operator: Disconnects a network component (e.g., host, router, bridge, link, or gateway). | |
| 80 | Expected Result: An alert indicating change to offline status of the network component is displayed on HP OpenView. Event is logged in the log file and entered in the management database. | |
| 90 | SMC Performance Analyst: Selects to collect the CPU metrics and Disk metrics in the global system performance metrics. | |
| 100 | Expected Result: Selection completed. | |
| 110 | SMC Performance Analyst: Queries the global system performance, specifically the system CPU use during interval and the number of disk drives configured on the system. | |
| 120 | Expected Result: The system CPU use during interval (percent of total and seconds) and the number of disk drives configured on the system are sent to the operator's screen. | |
| 130 | DAAC Production Monitor: Starts a DAAC production run (A100230.020\$G). | |
| 140 | Expected Result: Test case A100230.020\$G is started. | |
| 150 | SMC Performance Analyst: Double clicks on a selected site (i.e., GSFC) icon. | |
| 160 | Expected Result: Submap for selected site (GSFC) appears on the display. | |
| 170 | DAAC Computer Operator: Takes a host peripheral device (i.e., printer) at the selected site (GSFC) offline. | |
| 180 | Expected Result: The device (printer) icon changes to red on the OpenView display. | |
| 190 | DAAC Computer Operator: Puts the device (printer) online again. | |
| 200 | Expected Result: The device (printer) icon changes to green on the OpenView. | |

| | | |
|---|--|--------------|
| 210 | SMC Performance Analyst: Induces a fault (a valid parameter identifying the cause of the fault) in one of the peripherals. | |
| 220 | Expected Result: Fault notification is sent via e-mail. An alert indicating change in the peripheral's operational state appears on the Open View. Alert is recorded in the site's history log file and management database. | |
| 230 | SMC Performance Analyst: Queries the site's (GSFC) management database for information on the device on which the fault occurred. | |
| 240 | Expected Result: Fault information found in the database. | |
| 250 | SMC Performance Analyst: Examines the site's (GSFC) history log. | |
| 260 | Expected Result: The history log file contains information on the device fault. | |
| 270 | SMC Performance Analyst: Enters a command to set threshold for invalid logins to two; then enter two invalid logins. | |
| 280 | Expected Result: Threshold violation notification appears on the screen. | |
| 290 | SMC Performance Analyst: Requests summary report of daily site management data. | |
| 300 | Expected Result: A report is printed; events noted above appear in the report. | |
| Data Reduction and Analysis Steps: A. The following materials will be collected for analysis: 1. Printed summary report of daily site management data. 2. Printed site history log file B. The summary report and the history log file will be examined to verify that they contain the events described in this test procedure. | | |
| Signature: | | Date: |

8.1.4 Site Shutdown/Recovery Sequence

This sequence evaluates the capability of the SMC ECS site to perform documented emergency shut down procedures. This sequence also evaluates the capability of the SMC ECS site to recover from abnormal shut down and to provide continued performance, albeit in a degraded mode, during a device failure. A device failure is simulated during the restart process by forcing the RAID storage device to go off-line.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): There are no external interfaces needed for this sequence.

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Computer Operator

SMC System Administrator

Operational Scenario(s): The operations scenario, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that was used to develop tests in this sequence of tests is listed:

Computer System Administration Backup & Restore/Recovery Scenario (Section 3.1.2)

Test Dependencies: The following table identifies the test procedures in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|---|----------|
| A080140.010\$\$ | A080620.040\$\$ A080170.020\$\$ | Prior |
| A080150.010\$\$ | A080620.040\$\$ A080140.010\$\$ A080170.020\$\$ | Prior |
| A080150.020\$\$ | A080170.020\$\$ | Prior |

8.1.4.1 Emergency and Other Abnormal Shutdown

| | | | | | | | | | |
|---|--|---|--|------------------------|--|--------------------|--|----------------|--|
| TEST Procedure No.: A080140.010\$\$ | | Date Executed: | | Test Conductor: | | | | | |
| Title: | | Emergency and Other Abnormal Shutdown | | | | | | | |
| Objective: | | This confirms that the site's standard procedures contain methodology for responding to catastrophic situations that require immediate site shutdown and for other types of abnormal shutdown such as system critical equipment failure. | | | | | | | |
| Requirements | | Acceptance Criteria | | | | | | | |
| EOSD3000#A | | <p>This requirement is verified through demonstration.</p> <p>The ECS shall provide for security safeguards to cover unscheduled system shutdown (aborts) and subsequent restarts, as well as for scheduled system shutdown and operational startup.</p> <p>The emergency shutdown of the SMC ECS must be accomplished using the procedures documented in the <u>Mission Operation Procedures for the ECS Project</u>(DID 611/OP3).</p> <p>Part of the requirements, “subsequent restarts, as well as for scheduled system shutdown and operational startup”, are not verified in this procedure and are verified in 8.1.2 Site Startup Sequence.</p> | | | | | | | |
| Test Inputs: | | <u>Mission Operation Procedures for the ECS Project</u> (DID 611/OP3) Compromised Access Control Table file | | | | | | | |
| Data Set Name | | Data Set ID | | File Name | | Description | | Version | |
| N/A | | | | | | | | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | System Administrator: Induces a catastrophic security violation by compromising the Access Control Table. | |
| 20 | Expected Result: The Access Control Table file is corrupted. | |
| 30 | Computer Operator: Performs an emergency shutdown in accordance with procedures documented in the <u>Mission Operation Procedures for the ECS Project(DID 611/OP3)</u> . | |
| 40 | Expected results: HP OpenView shows that subsystems (TBD) are in red. The ECS is in the shut down state. NOTE: VERIFICATION OF THE SHUTDOWN STATE TO BE OBTAINED FROM THE MISSION OPERATION PROCEDURES FOR THE ECS PROJECT, DID 611/OP3 (IN DEVELOPMENT). | |
| Data Reduction and Analysis Steps: None | | |
| Signature: | | Date: |

8.1.4.2 Recovery From Catastrophic Emergency Shutdown

| | | | | | |
|--|--|--|------------------|------------------------|----------------|
| TEST Procedure No.: A080150.010\$\$ | | Date Executed: | | Test Conductor: | |
| Title: Recovery From Catastrophic Emergency Shutdown | | | | | |
| Objective: The purpose of this test is to verify the SMC ECS site can recover from an emergency shutdown. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| EOSD2990#A | | This requirement is verified by demonstration. The ECS elements shall support the recovery from a system failure due to a loss in the integrity of the ECS data or a catastrophic violation of the security system. The SMC ECS will be able to restore files following a simulated catastrophic violation of the security system. Part of the requirement, "...the recovery from a system failure due to a loss in the integrity of the ECS data", is not verified in this procedure and will be verified in 8.1.4.3 Recovery From Abnormal Non-Catastrophic Shutdown. | | | |
| EOSD3000#A | | This requirement is verified by demonstration. The ECS shall provide for security safeguards to cover unscheduled system shutdown (aborts) and subsequent restarts, as well as for scheduled system shutdown and operational startup. The SMC ECS will be able to restore files following a simulated catastrophic violation of the security system. Part of the requirement, "unscheduled system shutdown (aborts)" and "scheduled system shutdown and operational startup" are not verified in this procedure and are verified in 8.1.4.1 Emergency and Other Abnormal Shutdown and 8.1.2 Site Startup Sequence respectively. | | | |
| Test Inputs: <u>Mission Operation Procedures for the ECS Project(DID 611/OP3)</u> Access Control Table backup file | | | | | |
| Data Set Name | | Data Set ID | File Name | Description | Version |
| N/A | | | | | |

| Step-By-Step Procedures | | |
|-------------------------|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | ASSUMPTION: SYSTEM IS IN EMERGENCY SHUTDOWN STATE FROM PREVIOUS TEST. | |
| 10 | System Administrator: Determines that a restore of the Access Control Table file from the previous day's backup will fix the security violation problem. | |
| 20 | Expected Result: Computer Operator is informed by the System Administrator to restore the Access Control Table file. | |
| 30 | Computer Operator: Enters the commands to initialize the scripts to begin the restore. | |
| 40 | Expected Result: System initializes the scripts to restore the Access Control Table file. | |
| 50 | Computer Operator: Invokes the word processor and moves to the backup directory, to review the log file associated with the backup being restored. | |
| 60 | Expected Result: Log file is displayed on the terminal. | |
| 70 | Computer Operator: Selects the backupxxxxxx.log file (where xxxxxx represents the month, day, year of the backup.) | |
| 80 | Expected Result: System displays appropriate log file. | |
| 90 | Computer Operator: Prints out a copy of the log file. | |
| 100 | Expected Result: The log file is printed. | |
| 110 | Computer Operator: Exits the log file directory. | |
| 120 | Expected Result: System returns to word processor. Restore concludes and an indicator is returned to the operator. | |
| 130 | Computer Operator: Notices the indicator and realizes that the restore has concluded. From the word processor that is already up, opens the file pull down menu and selects open. Then opens the associated QA report. | |
| 140 | Expected Result: System displays the QA report. | |
| 150 | Computer Operator: Compares the QA report with the log file from the backup that was restored. | |
| 160 | Expected Result: The contents of the QA report and the log file are the same. | |
| 170 | Computer Operator: Initializes the script in accordance with procedures documented in the Mission Operation Procedures for the ECS Project(DID 611/OP3) to cold startup the ECS system. | |

| | | |
|---|---|--------------|
| 180 | Expected Result: 1. Executes the Startup Script. 2. MSS Agent is initialized. 3. MSS Agent calls the CSS Subsystem startup script. 4. CSS Subsystem software is started. 5. MSS Agent calls the ISS Subsystem startup script. 6. ISS Subsystem software is started. 7. MSS Agent opens the Gateway to allow for incoming requests. | |
| 190 | Computer Operator: Using the HP Open View Network Node Manager, examines the status of all devices within each submap. | |
| 200 | Expected Result: All devices, represented by icon symbols, are green. | |
| 210 | Computer Operator: Sends out a message to all operators, System Administrator and the Resource Controller notifying them that the system is up and running. | |
| 220 | Expected Result: A pop up message - The ECS HAS BEEN STARTED AND IS OPERATIONAL appears on the System Administrator's and Resource Controller's screens. | |
| Data Reduction and Analysis Steps: The backup log file (containing list of files backed up) and the QA report (containing list of files restored) are collected and analyzed. The QA report should contain the same Access Control Table file restored from the backup log. | | |
| Signature: | | Date: |

8.1.4.3 Recovery From Abnormal Non-Catastrophic Shutdown

| | | | | |
|---|-----------------------|---|--------------------|----------------|
| TEST Procedure No.: A080150.020\$\$ | Date Executed: | Test Conductor: | | |
| Title: Recovery From Abnormal Non-Catastrophic Shutdown | | | | |
| Objective: This test confirms the site's ability to restore corrupted files caused by an abnormal non-catastrophic shutdown using standard operational procedures. | | | | |
| Requirements | | Acceptance Criteria | | |
| EOSD2990#A | | This requirement is verified by demonstration. The ECS elements shall support the recovery from a system failure due to a loss in the integrity of the ECS data or a catastrophic violation of the security system. The SMC ECS must be able to restore the files following a simulated non-catastrophic failure. Part of the requirements, "a catastrophic violation of the security system", is not verified in this procedure and is verified in 8.1.4.2 Recovery From Catastrophic Emergency Shutdown. | | |
| Test Inputs: <u>Mission Operation Procedures for the ECS Project(DID 611/OP3)</u> MSS Workstation disc backup file | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| N/A | | | | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Computer Operator: Executes a simulated MSS Workstation disc crash then examines the HP OpenView. | |
| 20 | Expected Result: The SMC icon in HP OpenView is red. | |
| 30 | Computer Operator: Double clicks on the SMC icon to go down to the next level of submaps. | |
| 40 | Expected Result: The SMC submap displays on the screen. The MSS-SMC-1 icon is red. | |
| 50 | Computer Operator: Double clicks on the MSS-SMC-1 icon to go down to the next level of submaps. | |
| 60 | Expected Result: The MSS-SMC-1 submap displays on the screen. The disk drive icon is red. | |
| 70 | Computer Operator: Fails to write to the disk and determines that the disk has crashed. | |
| 80 | Expected Results: The disk cannot be written to. | |
| 90 | Computer Operator: Schedules the replacement and restore of the disk with the Resource Controller . | |
| 100 | Expected Results: Based on the resources needed and the time required to conduct the restore the event is scheduled. | |
| 110 | Computer Operator: Notifies all affected users that the system has crashed and a restore is scheduled at hhmm. This message also indicates the date of the backup to be used for restoration. | |
| 120 | Expected Results: System sends e-mail. | |
| 130 | Computer Operator: Retrieves the backup. | |
| 140 | Expected Result: The backup is retrieved. | |
| 150 | Computer Operator: Enters the commands to initialize the scripts to begin the restore. | |
| 160 | Expected Results: System initializes the scripts to restore the MSS Workstation disc file. | |
| 170 | Computer Operator: Invokes the word processor and selects "Open" from the file pull down menu to review the log file associated with the backup being restored. | |
| 180 | Expected Results: System displays the log file on the terminal. | |
| 190 | Computer Operator: Selects the Restorexxxxxx.log (where xxxxxx equals the month, day and year). | |
| 200 | Expected Results: System displays appropriate log file. | |
| 210 | Computer Operator: Prints out a copy of the log file. | |
| 220 | Expected Results: The log file is printed. | |
| 230 | Computer Operator: Exits the log file directory. | |
| 240 | Expected Results: System returns to word processor. Restore concludes and an indicator is returned to the operator. | |

| | | |
|---|--|--------------|
| 250 | Computer Operator: Restores the incremental backups taken since the last system backup, on top of the restored system backup to bring the system as close to realtime as possible. (To determine the latest incremental backup, the operator opens the inc_bkup_doc (tbd) file from the word processor and views a list of the latest incremental backups.) | |
| 260 | Expected Results: The incremental backup restore is concluded and an indicator is returned to the operator. | |
| 270 | Computer Operator: From the word processor that is already up, initializes the QA report associated with the restore. | |
| 280 | Expected Results: System displays the QA report. | |
| 290 | Computer Operator: Compares the QA report with the Log file from the backup that was restored. | |
| 300 | Expected Results: the contents of the QA report and the log file are the same. (This step is to be analyzed at Data Reduction and Analysis time.) | |
| 310 | Computer Operator: verifies that the system is back up and operational. | |
| 320 | Expected Results: HP OpenView shows that the SMC icon is up and running without any problems. This is conveyed by HP OpenView by a green icon. | |
| 330 | Computer Operator: Notifies (via e-mail) the affected users that the restore has concluded. | |
| 340 | Expected Results: System delivers e-mail. | |
| Data Reduction and Analysis Steps: The backup log file (containing list of files backed up) and the QA report (containing list of files restored) are collected and analyzed. Verify that the QA report contains the same file as that of the backup log. | | |
| Signature: | | Date: |

8.1.5 Site Maintenance Sequence

This sequence is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.6 Site Data/Metadata/Information Management Sequence

The SMC's ability to produce specified backups is verified in this sequence. The ECS capability for storage of ECS data/metadata/application information in local and off-site locations is verified.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: There are no external interfaces needed for this sequence.

Operator Position(s): The operator position from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support this sequence is listed:

SMC System Administrator

SMC Computer Operator

Operational Scenario(s): The operations scenario, taken from the Operations Scenarios for the ECS Project: Release-A document (605/OP1), that was used to develop tests in this sequence of tests are listed:

Computer System Administration Backup & Restore/Recovery Scenario (Section 3.1.2)

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.1.6.1 File Management

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.6.2 ECS Storage/Archive/Backup Capability

| | | | | | |
|--|--------------------|--|--------------------|------------------------|--|
| TEST Procedure No.: A080170.020\$S | | Date Executed: | | Test Conductor: | |
| Title: ECS Storage/Archive/Backup Capability | | | | | |
| Objective: The purpose of the test is to confirm the site's capability to store, archive, and backup data. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| EOSD3200#A | | This requirement is verified through test. A minimum of one backup which is maintained in a separate physical location shall be maintained for ECS software and key data items. The Tester makes a full backup of the site as well as a copy and verifies that the copy is stored in an off-site location. | | | |
| EOSD3220#A | | This requirement is verified through inspection. All media shall be handled and stored in protected areas with environmental and accounting procedures applied. The Tester verifies the existence of an off-site backup copy of data and verify the environmental and accounting procedures are applied in accordance with the <u>Property Management Plan for the ECS Project (602/OP1)</u> . | | | |
| Test Inputs: <u>Mission Operation Procedures for the ECS Project (611/OP3)</u> <u>Property Management Plan for the ECS Project (602/OP1)</u> | | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version | |
| | | | | | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | Full Backup | |
| 10 | Computer Operator: Performs a full system backup in accordance with the procedures documented in the <u>Mission Operation Procedures for the ECS Project (611/OP3)</u> . | |
| 20 | Expected Results: The system performs a full backup. | |
| 30 | Computer Operator: Lists files contained on the backup media. Verifies content of the listing. | |
| 40 | Expected Results: Displays files contained on the backup media. | |
| 50 | Computer Operator: Dumps contents of the backup media. Verifies the format of the data. | |
| 60 | Expected Results: The backup format meets ECS standards. | |
| 70 | Computer Operator: Makes a copy of the backup. | |
| 80 | Expected Results: The software performs the copy. Copy completes. | |
| 90 | Computer Operator: Unload and remove backup media from the storage devices. Insert new blank tape. | |
| 100 | Expected Results: Full back tape is removed and new blank tape is loaded. | |
| 110 | Computer Operator: Marks the copy for off-site storage. Store the full backup and its copy in an off-site protected area | |
| 120 | Expected Results: Full backup copy is marked. The full backup and its copy is stored in an off-site protected area | |
| | Incremental Backup | |
| 130 | Computer Operator: Performs an incremental backup in accordance with the procedures documented in the <u>Mission Operation Procedures for the ECS Project (611/OP1)</u> . | |
| 140 | Expected Results: The system performs an incremental backup. | |
| 150 | Computer Operator: Lists files contained on the backup media. Verifies content of the listing. | |
| 160 | Expected Results: Displays files contained on the backup media. | |
| 170 | Computer Operator: Dumps contents of the backup media. Verifies the format of the data. | |
| 180 | Expected Results: The backup format meets ECS standards. | |
| 190 | Computer Operator: Makes a copy of the backup. | |
| 200 | Expected Results: The software performs the copy. Copy completes. | |

| | | |
|---|---|--------------|
| 210 | Computer Operator: Unload and remove backup media from the storage devices. Insert new blank tape. | |
| 220 | Expected Results: Incremental backup tape is removed and new blank tape is loaded. | |
| 230 | Computer Operator: Marks the copy for off-site storage. Store the incremental backup and its copy in an off-site protected area | |
| 240 | Expected Results: Incremental backup copy is marked. The full backup and its copy is stored in an off-site protected area | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.1.7 Facilities Interfaces Sequence

This sequence verifies the basic connectivity and fundamental protocols for SMC external and internal interfaces in support of Release A operations. Confirmation of ECS internal (EOC, GSFC, LaRC, and EDC) and external interfaces (TSDIS, NOAA ADC and V0 DAACs) is performed through inspection of before and after data transmission products compared to requirements. Internal ECS interfaces are evaluated similarly. The operational version of external systems are used if they are mature and available at the time of acceptance testing on this sequence. Otherwise, simulators are used.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed:

TSDIS Simulator

EOC

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support this sequence are listed:

SMC System Administrator

DAAC System Administrator

FOT Operations Coordinator

Operational Scenario(s): There are no operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A (605/OP2) used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--|------------|
| A080180.090\$S | A080180.090\$G A080180.090\$L A080180.090\$F A080180.090\$E | Concurrent |

8.1.7.1 SMC External Interfaces

| | | | | | |
|---|--|--|------------------|--------------------------|----------------|
| TEST Procedure No.: A080180.020\$\$ | | Date Executed: | | Test Conductor: | |
| Title: SMC External Interfaces | | | | | |
| Objective: This test case verifies SMC connectivity with ECS external systems via e-mail | | | | | |
| Requirements | | Acceptance Criteria | | | |
| ESN-0070#A | | This requirement is verified through test. The ESN shall support the intrasite elements data flow requirements identified in this specification. The ISS must provide for connectivity with external interfaces in order to transfer data to the SMC. | | | |
| ESN-0280#A | | This requirement is verified through test. The ESN shall provide file transfer and management service and as a minimum must include the capability to transfer the following data types: a. Unstructured Text b. Binary Unstructured c. Binary Sequential d. Sequential Text The CSS File Access Service must be able to transfer text and binary files. | | | |
| ESN-0290#A | | This requirement is verified through test. The file transfer and management service shall be available in interactive and non-interactive services. The CSS File Access Service must provide functionality for interactive and non-interactive transfer of files (send and receive) between two host systems. | | | |
| ESN-0300#A | | This requirement is verified through test. The file transfer and management non-interactive services shall be able to be scheduled. The CSS File Access Service must provide an option for scheduling file transfers in a batch mode. | | | |
| Test Inputs: | | | | | |
| Data Set Name | | Data Set ID | File Name | Description | Version |
| EMAIL_001 | | | | Sample E-mail message | |
| EMAIL_002 | | | | Sample E-mail attachment | |

| Step-By-Step Procedures | | |
|---|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Tester: Set up the TSDIS e-mail simulator. | |
| 20 | Expected Results: The TSDIS e-mail simulator is on and ready for transfer. | |
| 30 | SMC Computer Operator: Access Communications Server and invoke E-mail software. | |
| 40 | Expected Results: The E-mail software window is displayed. | |
| 50 | SMC Computer Operator: Create a new message. Specify E-mail address at TSDIS. Specify subject and body of message to be sent to TSDIS. Attach file to the message. Send the message to TSDIS. | |
| 60 | Expected Results: The message is sent to TSDIS. | |
| 70 | SMC Computer Operator: View SMC E-mail logs to verify transmission of each E-mail message. | |
| 80 | Expected Results: System logs reflect transmission of each E-mail message. | |
| 90 | TSDIS Personnel: Views E-mail. The message is inspected for evidence of transmission errors. | |
| 95 | Expected Results: The message transmission does not contain any evidence of transmission errors, such as garbled text. | |
| 100 | TSDIS Personnel: Creates a reply message specifying E-mail address at SMC as well as the subject and body of message. Send the message to the SMC. | |
| 110 | Expected Results. The message is sent to the SMC. | |
| 120 | SMC Computer Operator: Opens reply message verifying receipt of reply message. Prints and deletes message. | |
| 130 | Expected Results: The hardcopy is available from the printer. The message no longer resides in the In box. | |
| Data Reduction and Analysis Steps: | | |
| a. The following are secured for analysis at the close of the procedure: E-mail logs and messages. | | |
| Signature: | | Date: |

8.1.7.2 EOC External Interfaces

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.7.3 GSFC DAAC External Interfaces

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.7.4 LaRC DAAC External Interfaces

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.7.5 EDC DAAC External Interfaces

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.1.7.6 ECS Internal Interfaces

| TEST Procedure No.: A080180.090\$S | Date Executed: | Test Conductor: |
|---|---|------------------------|
| Title: ECS Internal Interfaces | | |
| Objective: This test case verifies the capability for the SMC to communicate with the , GSFC, LaRC, EDC and EOC. | | |
| Requirements | Acceptance Criteria | |
| ESN-0010#A | This requirement is verified through test. ESN shall provide the following standard services: a. Data Transfer and Management Services b. Electronic Messaging Service c. Remote Terminal Service d. Process to Process Communication Service e. Directory and User Access Control Service f. Network Management Service g. Network Security and Access Control Service h. Internetwork Interface Services i. Bulletin Board Service The CSS Electronic Mail Service must allow the users to create, modify and delete messages. The CSS Electronic Mail Service must provide the ability to send and receive messages. The CSS Electronic Mail Service must provide the ability to attach files to messages. This test does NOT verify parts c, e, f and g of the requirement. | |
| ESN-0340#A | This requirement is verified through test. The ESN shall interoperate and exchange messages and data with external SMTP and X.400 mail systems. The Tester must verify the ability to provide translation between SMTP and X.400 protocols by creating a message in one protocol and sending/receiving it in another. | |
| ESN-0345#A | This requirement is verified through test. The ESN shall be capable of transparently transmitting Multi-purpose Internet Mail Extensions (MIME) messages. The CSS Electronic Mail Service must be capable of sending and receiving the Multi-purpose Internet Mail Extensions (MIME) messages. | |
| ESN-0350#A | This requirement is verified through test. The Electronic Messaging Service shall be capable of exchanging binary data. The CSS Electronic Mail Service must allow attaching either text or binary files to a message. | |

| | | | | |
|---|--|-----------|-------------|---------|
| ESN-0450#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide process-to-process communication service.</p> <p>The CSS Message service must provide an API for senders to send messages to receivers asynchronously without waiting for the receivers to receive it.</p> | | | |
| ESN-1170#A | <p>This requirement is verified through test.</p> <p>The ESN must provide necessary translation within supported file transfer and e-mail services.</p> <p>The CSS Electronic Mail Service must provide translation between SMTP and X.400 protocol.</p> | | | |
| ESN-1181#A | <p>This requirement is verified through demonstration.</p> <p>The ESN shall provide an ECS Bulletin Board capability.</p> <p>The CSS Bulletin Board Service must allow the users to post messages to and delete messages from bulletin board(s). The CSS Bulletin Board Service must provide the capability for copying files. The CSS Bulletin Board Service must support multiple bulletin boards. The CSS Bulletin Board Service must allow multiple messages for each bulletin board.</p> | | | |
| ESN-1350#A | <p>This requirement is verified by inspection.</p> <p>The ESN LANs shall provide physical devices and the corresponding medium access control (MAC) protocol compatible with ISO and ANSI standards.</p> <p>The Tester reviews the physical devices' specs and verifies that the medium access control (MAC) protocol is compatible with ISO and ANSI standards.</p> <p>Change verification method from analysis to inspection.</p> | | | |
| NSI-0010#A | <p>This requirement is verified through test.</p> <p>NSI, responsible for EOSDIS "Mission Success" network services, shall provide network connectivity to the following ECS facilities:</p> <p>a. ECS at the GSFC DAAC, Goddard Space Flight Center (GSFC), Greenbelt, Maryland</p> <p>c. System Monitoring and Coordination facility (SMC), Goddard Space Flight Center (GSFC), Greenbelt, Maryland</p> <p>f. ECS at the LaRC DAAC, Langley Research Center (LaRC), Hampton, Virginia</p> <p>The GSFC DAAC must be able to transfer data with the SMC and LaRC DAAC.</p> | | | |
| SMC-2120#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall make available for automated distribution to authorized users all unlicensed toolkit software, toolkit software upgrades, and toolkit documentation.</p> <p>The SMC must be able to post authorized unlicensed toolkit software, toolkit software upgrades, and toolkit documentation to the bulletin board.</p> | | | |
| SMC-2610#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall provide and maintain a bulletin board service with information on ECS status, events, and news.</p> <p>The SMC must be able to post information on ECS status, events, and news to the bulletin board.</p> | | | |
| Test Inputs: Valid account names and passwords for accounts at each DAAC, SMC and EOC. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |

| | | | | |
|-------------|--|--|--|--|
| TOOLKIT_001 | | | authorized unlicensed toolkit software | |
| TOOLKIT_002 | | | toolkit software upgrades | |
| TOOLKIT_003 | | | toolkit documentation | |
| EMAIL_001 | | | Sample E-mail message | |
| EMAIL_002 | | | Sample E-mail attachment | |

| Step-By-Step Procedures | | |
|--------------------------------|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Computer Operator: Access Communications Server and invoke E-mail software. | |
| 20 | Expected Results: The E-mail software window is displayed. | |
| 30 | SMC Computer Operator: Create a new message. Specify E-mail address at LaRC DAAC. Specify subject and body of message to be sent to LaRC DAAC. Attach file to the message. Send the message to LaRC DAAC. | |
| 40 | Expected Results: The message is sent to the LaRC DAAC. | |
| 50 | SMC Computer Operator: Select message sent to LaRC. Change E-mail address at EDC DAAC. Edit subject and body of message to be sent to EDC DAAC. Attach file to the message. Send the message to EDC DAAC. | |
| 60 | Expected Results: The message is sent to the EDC DAAC. | |
| 70 | SMC Computer Operator: Create a new message. Specify E-mail address at SMC DAAC. Specify subject and body of message to be sent to SMC DAAC. Attach text and binary files to the message. Send the message to GSFC DAAC. | |
| 80 | Expected Results: The message is sent to the GSFC DAAC. | |
| 90 | SMC Computer Operator: Create a new message. Specify E-mail address at EOC DAAC. Specify subject and body of message to be sent to EOC DAAC. Attach file to the message. Send the message to EOC DAAC. | |
| 100 | Expected Results: The message is sent to the EOC DAAC. | |
| 110 | SMC Computer Operator: View SMC E-mail logs to verify transmission of each E-mail message. | |
| 120 | Expected Results: System logs reflect transmission of each E-mail message. | |
| 130 | LaRC Computer Operator: Views E-mail. The message is inspected for evidence of transmission errors. | |
| 140 | Expected Results: The message transmission does not contain any evidence of transmission errors, such as garbled text. | |
| 150 | LaRC Computer Operator: Creates a reply message specifying E-mail address at SMC as well as the subject and body of message. Send the message to the SMC. | |
| 160 | Expected Results. The message is sent to the SMC. | |
| 170 | SMC Computer Operator: Opens reply message verifying receipt of reply message. Prints and deletes message. | |
| 180 | Expected Results: The hardcopy is available from the printer. The message no longer resides in the In box. | |

| | | |
|-----|---|--|
| 190 | EDC Computer Operator: Views E-mail. The message is inspected for evidence of transmission errors. | |
| 200 | Expected Results: The message transmission does not contain any evidence of transmission errors, such as garbled text. | |
| 210 | EDC Computer Operator: Creates a reply message specifying E-mail address at SMC as well as the subject and body of message. Send the message to SMC. | |
| 220 | Expected Results. The message is sent to the SMC. | |
| 230 | SMC Computer Operator: Opens reply message verifying receipt of reply message. Prints and deletes message. | |
| 240 | Expected Results: The hardcopy is available from the printer. The message no longer resides in the In box. | |
| 250 | GSFC Computer Operator: Views E-mail. The message is inspected for evidence of transmission errors. | |
| 260 | Expected Results: The message transmission does not contain any evidence of transmission errors, such as garbled text. | |
| 270 | GSFC Computer Operator: Creates a reply message specifying E-mail address at SMC as well as the subject and body of message. Send the message to SMC. | |
| 280 | Expected Results. The message is sent to the SMC. | |
| 290 | SMC Computer Operator: Opens reply message verifying receipt of reply message. Print and delete message. | |
| 300 | Expected Results: The hardcopy is available from the printer. The message no longer resides in the In box. | |
| 310 | FOT Operations Coordinator: Views E-mail. The message is inspected for evidence of transmission errors. | |
| 320 | Expected Results: The message transmission does not contain any evidence of transmission errors, such as garbled text. | |
| 330 | FOT Operations Coordinator: Creates a reply message specifying E-mail address at SMC as well as the subject and body of message. Send the message to SMC. | |
| 340 | Expected Results. The message is sent to the SMC. | |
| 350 | SMC Computer Operator: Opens reply message verifying receipt of reply message. Print and delete message. | |
| 360 | Expected Results: The hardcopy is available from the printer. The message no longer resides in the In box. | |
| 370 | SMC Computer Operator: Creates multiple messages and posts them to a bulletin board. | |
| 380 | Expected Results: Multiple messages are created and posted to the bulletin board. | |
| 390 | SMC Computer Operator: Accesses the bulletin board and verifies that the messages are present. | |
| 400 | Expected Result: The messages are accessible through the bulletin board. | |

| | | |
|---|--|--------------|
| 410 | GSFC Computer Operator: Creates multiple messages and posts them to multiple bulletin boards. | |
| 420 | Expected Results: Multiple messages are created and posted to the bulletin board. | |
| 430 | SMC Computer Operator: Accesses the bulletin boards and verifies that the messages are present. | |
| 440 | Expected Result: The messages are accessible through the bulletin boards. | |
| 450 | SMC Computer Operator: Copies toolkit files from the bulletin board. | |
| 460 | Expected Result: Lists the contents of the directory to verify the receipt of the downloaded file. | |
| 470 | SMC Computer Operator: Deletes a message from the bulletin board. | |
| 480 | Expected Result: The bulletin board refreshes without the deleted message reflecting the deletion. | |
| 490 | SMC Computer Operator: Accesses a different bulletin board and deletes multiple messages. | |
| 500 | Expected Result: The bulletin board refreshes without the deleted message reflecting the deletion. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.2 Scheduling Scenario

The Scheduling Scenario verifies the ability to generate a series of schedules involving his/her site and support by other sites. It follows the process of scheduling the activities at each site, coordinating them with other sites through the SMC and resolving scheduling conflicts when they arise. The scenario then continues with the development of a coordinated master schedule by SMC operators. It carries the SMC operators through the schedule request, development, confirmation and adjudication process; returning in full-circle to the scheduler who initiated the schedule request.

The purpose of this scenario is to evaluate the ECS site-level scheduling capability. ECS capability for acquiring, storing and maintaining schedules, negotiating and maintaining ground event functional allocations and priorities are assessed. SMC procedures for acquiring and maintaining ECS schedules, and for generating associated site-to-site and site-to-site integration, test, simulation, operations and maintenance directives are also evaluated.

This scenario also evaluates procedures for adjudicating cross-site and cross-facility schedule conflicts in the best interests of the systems users and in a manner that promotes the most efficient use of all ECS site and the total ECS system.

Procedures for receiving and analyzing product generation schedules from the DAACs and other ECS sites are evaluated as well as SMC's methodology for recommending, reviewing, approving and disseminating information related to schedule implementations or adjustments.

Each site's LSM scheduling activity is evaluated for its ability to communicate and receive scheduling information from the SMC as well as its effectiveness in monitoring, coordinating and implementing SMC integrated schedules within assigned sites.

8.2.1 Schedule Generation Sequence

The Schedule Generation Sequence follows the operator through the schedule generation process. The sequence confirms the SMC systems scheduler's capability for generating, analyzing inputs, integrating, and distributing approved system-level schedules and for developing and communicating appropriate site scheduling guidelines for instrument and ground event scheduling. The abilities to receive, analyze and implement scheduling directives and subsequent coordination and implementation by scheduling personnel into SMC planning are evaluated.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed:

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Operations Supervisor

SMC Resource Controller

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests.

Test Dependencies: A table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|----------------------------------|--------------|
| A080210.020\$\$ | A080210.020\$G A080210.020\$L | concurrently |

8.2.1.1 DAAC Schedule Generation

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.2.1.2 SMC Schedule Generation

| TEST Procedure No.: A080210.020\$S | Date Executed: | Test Conductor: |
|--|--|------------------------|
| Title: SMC Schedule Generation | | |
| Objective: This test case follows the operator through the schedule generation process. | | |
| Requirements | Acceptance Criteria | |
| SMC-0320#A | <p>The verification method used is test.</p> <p>The SMC shall be capable of scheduling ground activities to a minimum of one minute resolution.</p> <p>The requirement interpretation is that there will be Resource Planning at DAAC's and SMC.</p> | |
| SMC-1300#A | <p>The verification method used is test.</p> <p>The SMC shall support and maintain the ECS policies and procedures regarding instrument and ground event scheduling, including, at a minimum:</p> <ul style="list-style-type: none"> a. Mission and science guidelines b. Directives for scheduling instrument data ingest, processing, reprocessing, retrieval, and data distribution <p>The test procedure verifies SMC capabilities to provide schedule directives to DAAC sites in response to simulated AM-1 status and coordination data received by the SMC from EDOS, and TRMM Level-0 data transmission coordination data from TSDIS.</p> <p>Performed manually, except to the extent the staff opts to automate by using office automation tools and e-mail.</p> | |
| SMC-1310#A | <p>The verification method used is test.</p> <p>The SMC shall support and maintain the allocation of ground event functions and capabilities to each site and element.</p> <p>The test procedure demonstrates that the SMC maintains and generates proper ECS scheduling actions appropriate to the need to transmit and capture ESDIS data.</p> <p>Manually performed with support from office automation tools.</p> | |
| SMC-1320#A | <p>The verification method used is test.</p> <p>The SMC shall support and maintain priorities used in scheduling ground events.</p> <p>A cross-DAAC process dependency situation is simulated which causes the need for system-wide scheduling along with a need for limited resource reconfiguration actions to resolve conflicts.</p> <p>SMC handling of ground events is viewed as manually supported by office automation tools. Priorities supported for resource planning at sites.</p> | |
| SMC-1340#A | <p>The verification method used is test.</p> <p>The SMC shall generate scheduling directives for system level, site-to-site, and element-to-element integration, testing, and simulation activities.</p> <p>The scheduling reports generated and directives issued will be analyzed to determine SMC's ability to properly schedule and re-schedule ECS sites.</p> <p>Manual exchange of schedules.</p> | |

| Test Inputs: Schedule directives - for DAAC sites in response to simulated AM-1 status and coordination data received by the SMC from EDOS, and TRMM Level-0 data transmission coordination data from TSDIS. | | | | |
|---|--------------------|------------------|---------------------|----------------|
| Data Set Name | Data Set ID | File Name | Description | Version |
| SCH 001 | | | Schedule directives | |

| Step-By-Step Procedures | | |
|--|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Operations Supervisor: Sends a new scheduling directive to the DAAC's. | |
| 20 | Expected Result: Scheduling directive is received | |
| 30 | SMC Resource Controller: Invokes the resource planning system. | |
| 40 | Expected Result: Planning system menu is displayed with two selection options: a. Create NEW plan. b. Modify existing plan. | |
| 50 | SMC Resource Controller: Selects a plan. | |
| 60 | SMC Resource Controller: Enters the following types of request data into menu displayed: - ground event - description - start time - duration | |
| 70 | SMC Resource Controller: After entering the required inputs, sends the requests to the resource planning system. | |
| 80 | Expected Results: a) System receives the requests and notifies the SMC Resource Controller of the receipt. b) The ground event requests are processed and production resources are allocated for implementation automatically. c) The system builds the resource plan and sends it to the SMC Resource Controller. | |
| 90 | SMC Resource Controller: Receives the resource plan. NOTE: If there are any discrepancies with the plan, the SMC Resource Controller must contact the Production Planner to resolve the problems via e-mail, by phone, etc. | |
| Data Reduction and Analysis Steps: Summary and detail reports issued to the SMC, and the DAAC's reaction to SMC directives will be analyzed to determine the DAAC's ability to make schedule requests and to properly respond to schedule information received from the SMC. | | |
| Signature: | | Date: |

8.2.2 Schedule Adjudication Sequence

The Schedule Adjudication Sequence primarily involves the SMC to confirm the process for adjudicating ECS schedules. The SMC capability for distributing schedule adjudication results is assessed based on comparison with ECS requirements. Finally, system and site abilities for monitoring SMC and each site's progress and thoroughness in making on-site schedule adjustments based on approved adjudication results are confirmed.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Performance Analyst

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests.

Test Dependencies: A table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|----------------------------------|--------------|
| A080220.030\$\$ | A080220.020\$G A080220.020\$L | concurrently |

8.2.2.1 Adjudication of ECS Site Conflicts

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.2.2.2 Adjudicate Contention for Resources Between ECS Sites

| | | |
|---|---|------------------------|
| TEST Procedure No.: A080220.030\$\$ | Date Executed: | Test Conductor: |
| Title: Adjudicate Contention for Resources Between ECS Sites | | |
| Objective: This test case for the Adjudicate Contention for Resources Between ECS Sites verifies SMC requirements to resolve contention for resources between ECS sites. | | |
| Requirements | Acceptance Criteria | |
| SMC-1310#A | The verification method used is test. The SMC shall support and maintain the allocation of ground event functions and capabilities to each site and element. The test procedure verifies that SMC performs analysis and conflict resolution in response to problems associated with ECS ground event schedules or abnormal service delays between sites. Manually performed with support from office automation tools. | |

| | | | | |
|---|--|-----------|-------------|---------|
| SMC-1320#A | <p>The verification method used is test.</p> <p>The SMC shall support and maintain priorities used in scheduling ground events.</p> <p>The test procedure verifies that each internal ECS site forwards requests for conflict resolution and intervention messages to the SMC. The test procedure verifies that the SMC accepts the messages, performs its level of impact analysis, then concurs with the recommended resolution from the DAAC.</p> <p>SMC handling of ground events is viewed as manually supported by office automation tools. Priorities supported for resource planning at sites.</p> | | | |
| SMC-1340#A | <p>The verification method used is test.</p> <p>The SMC shall generate scheduling directives for system level, site-to-site, and element-to-element integration, testing, and simulation activities. Simulated ECS ground event problems or resource contention problems are initiated at each connection between DAACs and SMC. The simulations introduce abnormal response times for a remote site's access to ECS archived products, user services or repository of ECS status information.</p> <p>Manual exchange of schedules.</p> | | | |
| SMC-1360#A | <p>The verification method used is test.</p> <p>The SMC shall generate ground resource scheduling directives, or recommendations for FOS elements, in response to emergency situations.</p> <p>Simulated ECS ground event problems or resource contention problems are initiated at the connection between the EOC and the SMC.</p> <p>This is viewed as procedural supported by office automation tools, e-mail, etc.</p> | | | |
| Test Inputs: Resource lists from each ECS Site - so that the SMC can resolve contention for resources between ECS sites. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| RES 001 | | | Resources | |

| Step-By-Step Procedures | | |
|---|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Performance Analyst: Initiate simulated ECS ground event problems or resource contention problems at each connection between DAACs, EOC, and SMC. | |
| 20 | Expected Results: The simulations introduce abnormal response times for a remote site's access to ECS archived products, user services or repository of ECS status information . | |
| 30 | SMC Performance Analyst: Monitor the site responses. | |
| 40 | Expected Results: ECS DAACs issue notifications to the SMC when the site's access requests are not satisfied within specified time periods. | |
| 50 | SMC Performance Analyst: Each ECS site forwards requests for conflict resolution and intervention messages to the SMC. | |
| 60 | Expected Results: The SMC accepts the messages, performs its level of impact analysis, then concurs with the recommended resolution from the DAAC. | |
| 70 | SMC Performance Analyst: Identify the conflicts identified by the sites. | |
| 80 | Expected Results: Summary report(s) identifying the extent of the conflict are produced and that these reports delineate the cause of service delays, and processing dependencies associated with the conflict. | |
| Data Reduction and Analysis Steps: The SMC produces proposed solutions along with a schedule for implementation for each conflict resolution. | | |
| Signature: | | Date: |

8.3 ECS Site Upgrade Scenario

This scenario traces the steps taken by the M&O staff in the process of implementing changes to the ECS site environment. It carries the maintenance personnel through established procedures for system upgrades and enhancements.

The purpose of this scenario is to provide confirmation of the SMC's, each site's, and the total system's ability to successfully evolve through installation of minor enhancements and major upgrades. ECS overall and site capability for ascertaining the validity and assessing impacts of requested modifications is inspected.

8.3.1 Enhancements Sequence

This sequence confirms the SMC ability to coordinate enhancements with the ECS site-level teams. An examination is performed to provide evidence that proper coordination actions with SMC takes place that reflect the newly installed enhancement. SMC's abilities to originate and distribute site enhancements are assessed.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed:

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support this sequence are listed:

DAAC User Services Representative

Screening Committee

SMC CM Administrator

SEO

GSFC Site CCB

(includes DAAC Operations Supervisor, DAAC Resource Manager, others TBD)

Operational Scenario: The following scenarios, taken from the Opts Concept, Part 2A document, are used during this sequence of tests.

3.4.7 System Enhancement Scenario (Section 3.4.7)

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.3.1.1 ECS Enhancements

| | | | | |
|---|-----------------------|---|------------------------|----------------|
| TEST Procedure No.: A080320.010\$\$ | Date Executed: | | Test Conductor: | |
| Title: ECS Enhancements | | | | |
| Objective: This test provides ECS software, hardware and general managers with assurance that the GSFC DAAC has satisfactory software enhancement procedures in place. Each applicable written policy, procedures and as-built architecture specifications for managing and performing system enhancements are required inputs for this test case. Procedures are inspected for satisfactory life cycle coverage of enhancement initiation, implementation, and installation. Enhancement configuration management procedures are inspected and compared with enhancement procedures for specification of timely reviews and baseline updates that assure the site's ability to update and retain configuration status. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2520#A | | This requirement is verified through demonstration. The SMC shall evaluate received system enhancement requests to determine, at a minimum: a. Technical feasibility b. Implementation schedule c. Expected costs d. Existing system-wide hardware and software impacts During the test, SMC must assist the LSMs in installing the software enhancements. Change verification method from analysis to demonstration. | | |
| SMC-2530#A | | This requirement is verified through demonstration. Upon approval of a system enhancement, the SMC shall provide overall management of the implementation of the approved changes to the hardware and system software. During the test, SMC must assist the LSMs in installing the software enhancements. Change verification method from analysis to demonstration. | | |
| SMC-2540#A | | This requirement is verified through demonstration. Upon approval to include a fully tested enhancement to the algorithms, the SMC shall provide overall management of the implementation of the approved and modified software into the operational environment. During the test, SMC must assist the LSMs in installing the software enhancements. Change verification method from analysis to demonstration. | | |
| Test Inputs: | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| SW_001 | | | S/W enhancement file | |
| CCR_001 | | | CCR | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | User Services Representative: Accesses URDB to submit an enhancement recommendation for one of the ECS custom toolkits. | |
| 20 | Expected Results: URDB input screen is displayed on the screen. | |
| 30 | User Services Representative: Enters his/her name, e-mail address, phone number, agency's name, recommendation title, and the recommendation. | |
| 40 | Expected Results: The system provides an ID number for future reference to this recommendation. | |
| 50 | Screening Committee: Accesses the URDB. | |
| 60 | Expected Results: URDB displays the enhancement recommendation. | |
| 70 | Screening Committee: Reviews the enhancement recommendation, determines that the recommendation has merit, has system-wide impact, and should be submitted via a configuration change request (CCR) to ESDIS CCB for approval. Screening Committee Member (SCM): Changes status of recommendation to reflect its consideration for implementation. | |
| 80 | Expected Result: URDB stores the status update. | |
| 90 | SCM: Executes DDTS to compose the CCR. | |
| 100 | Expected Results: The DDTS displays on the screen. | |
| 110 | SCM: Clicks the "Submit" button to bring up the CCR input screen. | |
| 120 | Expected Results: The DDTS displays the CCR input screen. | |
| 130 | SCM: Enters the class and project name for the CCR. | |
| 140 | Expected Results: The DDTS accepts the input and displays the CCR form. | |
| 150 | SCM: Enters the name of the toolkit, version number, descriptive title for the CCR, recommended priority, recommendation (includes references to the URDB ID number) on the form and then clicks the "Commit" button. | |
| 160 | Expected Results: The DDTS stores the CCR information in its data base, sets an initial state (new), and sends e-mail notification of its existence to the SMC CM Administrator and the SEO. | |
| 170 | SEO Staff Member (SM): Receives e-mail notification and accesses DDTS. | |
| 180 | Expected Results: DDTS displays the CCR. | |
| 190 | SM: Reviews the CCR ad prints it to a designated file. | |
| 200 | Expected Results: DDTS prints a copy of the CCR to a designated file. | |

| | | |
|-----|---|--|
| 210 | SM: Executes e-mail. | |
| 220 | Expected Results: E-mail is displayed on the screen. | |
| 230 | SM: Composes a message attaching a copy of the CCR addressed to each site's SE for an impact assessment and sends the message. | |
| 240 | Expected Results: E-mail facility transmits the message with the attached CCR file to each site and notifies the recipients that they have mail. | |
| 250 | Site SE: Executes e-mail. | |
| 260 | Expected Results: E-mail is displayed on the screen. | |
| 270 | Site SE: Opens and assesses the message and attached CCR. Creates a forwarded message addressed to the site CM Administrator, the message contains assessment information such as the purpose of the assessment, name of requesting agency, impact to site resources, benefits to site, recommendation, and a copy of the CCR. Sends the message. | |
| 280 | Expected Results: E-mail facility transmits the message with the attached CCR file to the Site CM Administrator and notifies the recipient that he/she has mail. | |
| 290 | Site CM Administrator: Executes e-mail. | |
| 300 | Expected Results: E-mail is displayed on the screen. | |
| 310 | Site CM Administrator: Opens and assesses the message and attached CCR and forwards a message addressed to the site CCB for review and approval. Sends the message. | |
| 320 | Expected Results: E-mail facility transmits the message with the attached CCR file to the Site CCB and notifies the recipient that he/she has mail. | |
| 330 | Site CCB: Executes e-mail. | |
| 340 | Expected Results: E-mail is displayed on the screen. | |
| 350 | Site CCB: Opens, reviews and approves the assessment. | |
| 360 | Site SE: E-mails site assessment to the SEO. | |
| 370 | Expected Results: E-mail facility transmits assessment to SEO and notifies the recipient. | |
| 380 | SEO SM: Executes e-mail. | |
| 390 | Expected Results: E-mail is displayed on the screen. | |
| 400 | SEO SM: Opens and reads the sites' assessments. | |
| 410 | Expected Result: Assessment appears on the screen. | |
| 420 | SEO SM: Accesses DDTs. | |
| 430 | Expected Results: DDTs appears on the screen. | |
| 440 | SEO SM: Selects the CCR in the index. | |
| 450 | Expected Results: The CCR appears on the screen. | |
| 460 | SEO SM: Clicks the "Modify" button and then selects the "Add Enclosure" option. | |
| 470 | Expected Results: The "Add Enclosure" window appears. | |

| | | |
|---|--|--------------|
| 480 | SEO SM: Enters the summary of the impact assessments, cost estimates, and recommendation. Then, executes the editor's File Menu's save option and enters an enclosure title. | |
| 490 | Expected Results: DDTS saves the information under the entered enclosure title. | |
| 500 | SEO SM: Uses the "Add Enclosure" feature to insert each of the sites' assessment file into an enclosure and names each site's assessment enclosure accordingly. | |
| 510 | Expected Results: DDTS saves the content of each file under the entered enclosure title. DDTS sends e-mail notification of the update to the CCR originator, the URDB SCM | |
| 520 | SEO SM: Selects the "File" menu then selects "print." | |
| 530 | Expected Results: DDTS prints the CCR. | |
| 540 | SEO SM: Sends a card copy of the CCR to the ESDIS CCB for review and approval. | |
| 550 | ESDIS CCB: Reviews and approves the CCR and issues implementation instructions. | |
| 560 | SMC CM Administrator: Accesses URDB. | |
| 570 | Expected Results: the URDB is displayed. | |
| 580 | SMC CM Administrator: Updates the recommendation record to reflect ESDIS CCB's decision. | |
| 590 | Expected Results: URDB stores the information. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.4 Configuration Management Scenario

This scenario confirms the ECS capability for performing site-level configuration management. Resource management is evaluated for effective, complete and prompt coordination and movement between ECS sites of resources and operational directives. The logistics management activities are assessed for their combined ability to monitor and communicate information concerning spares and consumable inventories and replenishment.

The completeness, effectiveness and the degree of comprehensives of the ECS capability for controlling and maintaining system-wide inventories. ECS system-level quality management is evaluated for its ability to assess overall ECS performance within the SMC, for effective SMC/LSM coordination, and for satisfactory LSM quality assurance procedures. AT configuration management evaluations include assessment of the ECS network management capability for providing control of network configuration parameters and resources.

8.4.1 Resource Management Sequence

This sequence confirms the SMC resource management abilities for providing system-level information, equipment and software resources to the sites. The site management and operations team demonstrates the SMC capability to generate and send ground operations events to sites for implementation, as well as the LSM capability for conveying, monitoring and reporting to the SMC on the status and progress of the implementation of these activities.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Computer Operator

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

Resource Planning Activities (section 3.7)

Resource Management and Control Activities (section 3.8)

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|----------------------------------|--------------|
| A080410.010\$\$ | A080410.010\$G A080410.010\$L | concurrently |

8.4.1.1 Resource Management Directive

| | | | | |
|--|-----------------------|---|--------------------|----------------|
| TEST Procedure No.: A080410.010\$\$ | Date Executed: | Test Conductor: | | |
| Title: Resource Management Directive | | | | |
| Objective: This test case verifies the SMC's ability to generate managerial and operational directives. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2110#A | | The verification method used is demonstration. The SMC shall have the capability to generate managerial and operational directives affecting, at a minimum, an elements: a. Operational status b. Resource allocation c. Upgrade This test procedure investigates the SMC M&O staff's ability to generate managerial and operational directives, such as directives involving operational status, resource allocation and upgrade to the sites' LSM M&O procedures. Manually, except to the extent the staff opts to automate by using office automation tools. | | |
| Test Inputs: Resource management policies (hard copies) | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Computer Operator: Logon to the workstation. The office automation tools must be available on the workstation. | |
| 20 | SMC Computer Operator: Select the tools option from the menu. | |
| 30 | Expected Results: The tools menu is displayed. | |
| 40 | SMC Computer Operator: Select the option for office automation. | |
| 50 | Expected Results: The office automation menu is displayed. | |
| 60 | SMC Computer Operator: Select the option for GhostView and follow directions to view a document. | |
| 70 | note: To view a policy, procedure, or directive that was previously stored in the database. SMC Computer Operator: Choose open under the file button and select the desired file to view. | |
| 80 | Expected Results: The selected file is displayed. | |
| 90 | SMC Computer Operator: Select the print button. | |
| 100 | Expected Results: The selected file is printed. | |
| 110 | SMC Computer Operator: Select close to close the desired file. | |
| 120 | SMC Computer Operator: Select quit to exit the processor. | |
| 130 | Expected Results: The MSWindows Program Manager appears. | |
| 140 | note: To view the DAAC files for operational status, resource allocations, or any system upgrades. SMC Computer Operator: Select the MSWindows option from under the Office Automation option. | |
| 150 | Expected Results: The MSWindows' Program Manager is displayed. | |
| 160 | SMC Computer Operator: Select the file button. | |
| 170 | Expected Results: The file menu is displayed under a disk drive. | |
| 180 | SMC Computer Operator: Select the correct disk drive and the file in either Microsoft Word or Excel format and select the open button to view the document. | |
| 190 | Expected Results: The document is displayed. | |
| 200 | SMC Computer Operator: Select print to print the document if desired. | |
| 210 | SMC Computer Operator: Insert or delete changes into the desired file, then select save. | |
| 220 | Expected Results: The changes are saved in the document. | |
| 230 | SMC Computer Operator: To exit the processor select quit. | |

| | | |
|--|--|--------------|
| 240 | Expected Results: The MSWindows program manager appears. | |
| 250 | SMC Computer Operator: To end this test exit Windows. | |
| 260 | Expected Results: Operator View is displayed. | |
| Data Reduction and Analysis Steps: none | | |
| Signature: | | Date: |

8.4.2 Maintenance Management Sequence

This sequence illustrates the SMC capabilities for managing system-level maintenance activities, personnel, and resources in performing on-site and off-site preventative and corrective maintenance activities.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Operations Supervisor

SMC Computer Operator

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--------------------|----------|
| none | | |

8.4.2.1 On-site Preventive Maintenance

| | | | | |
|--|-----------------------|---|------------------------|----------------|
| TEST Procedure No.: A080420.030\$\$ | Date Executed: | Test Conductor: | | |
| Title: On-site Preventive Maintenance | | | | |
| Objective: This test case verifies that the SMC and LSM has the ability to provide on-site preventive maintenance support at each site. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2200#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall assist each site or element, when necessary, in the performance of on-site preventive and corrective hardware and systems software maintenance.</p> <p>This procedure verifies the SMC and LSM M&O staff's ability to provide on-site preventive maintenance support at each site. When a preventive maintenance action is scheduled, LSM personnel notify the affected users prior to the maintenance occurring of any user services which may be affected during the preventive maintenance period.</p> <p>Facilitation of this requirement will be described by M&O in their 611/OP3 document.</p> | | |
| Test Inputs: Preventive maintenance schedules from each site. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| PMX 001 | | | Preventive maintenance | |

| Step-By-Step Procedures | | |
|---|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Operations Supervisor: Review the policies and procedures to be applied to preventive maintenance of all hardware and software for which M&O has responsibility. | |
| 20 | Expected Result: Hardware and software preventive maintenance policies and procedures are reviewed. | |
| 30 | SMC Operations Supervisor: Review system discrepancy reports. | |
| 40 | Expected Result: Discrepancy reports are reviewed (DID413 is for discrepancy reporting. These reports start 2 months after each release. There will probably not be any reports for the release A test.) | |
| 50 | SMC Operations Supervisor: Investigate the discrepancies for anomalies and inefficiencies, and for possible operational work around. | |
| 60 | Expected Result: Maintenance problem is analyzed. | |
| 70 | SMC Operations Supervisor: Prepare a Configuration Management Report. | |
| 80 | Expected Result: The change is accepted by the Board. | |
| 90 | SMC Operations Supervisor: Accept the implementation of modifications to hardware or source code, operational procedures, user documentation, engineering diagrams, and programmer documentation. | |
| 100 | Expected Result: Hardware or software modification is ready for installation. | |
| 110 | SMC Computer Operator: Run test procedure for the system modification. | |
| 120 | Expected Result: Test is passed. This resolves the DR. The documentation is accepted and the CCB is notified. | |
| 130 | SMC Operations Supervisor: Notify the operations personnel and affected users of the hardware or software resolution and installation schedule prior to installation. | |
| 140 | Expected Result: Notification is served and the modification is installed. | |
| Data Reduction and Analysis Steps: Upon completion of the maintenance procedure, the SMC and LSM personnel update the maintenance database with information on the preventive action taken and the results obtained | | |
| Signature: | | Date: |

8.4.2.2 On-site Corrective Maintenance

| | | | | |
|---|-----------------------|--|--------------------|----------------|
| TEST Procedure No.: A080420.040\$S | Date Executed: | Test Conductor: | | |
| Title: On-site Corrective Maintenance | | | | |
| Objective: This test case verifies that the SMC and LSM has the ability to provide on-site corrective maintenance support. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2200#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall assist each site or element, when necessary, in the performance of on-site preventive and corrective hardware and systems software maintenance.</p> <p>When a problem is detected, the site user contacts the LSM corrective maintenance personnel. The LSM technician performs diagnostic actions and attempts to identify and isolate the cause of the problem. When a technician determines that the equipment cannot be repaired on-site, it is shipped to an off-site facility for repair. If the problem cannot be resolved by LSM personnel, the SMC staff is then informed of the situation. At this point, the SMC staff dispatches technicians to provide assistance to the LSM at the site.</p> <p>Facilitation of this requirement will be described by M&O in their 611/OP3 document.</p> | | |
| Test Inputs: A corrective maintenance event | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|---|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Operations Supervisor: Review the policies and procedures to be applied to corrective maintenance of all hardware and software for which M&O has responsibility. | |
| 20 | Expected Result: Policies and procedures are reviewed (DIDs 601,607, and 609). | |
| 30 | SMC Operations Supervisor: Review system discrepancy reports. | |
| 40 | Expected Result: Discrepancy reports are reviewed (DID 413). | |
| 50 | SMC Operations Supervisor: Run troubleshooting procedure and diagnostic tests to check the suspected hardware or software. | |
| 60 | Expected Result: Results are obtained. | |
| 70 | SMC Operations Supervisor: If there is a corrective maintenance problem prepare a Configuration Management Report. | |
| 80 | Expected Result: The change is accepted by the Board. | |
| 90 | SMC Operations Supervisor: Accept the implementation of modifications to hardware or source code, operational procedures, user documentation, engineering diagrams, and programmer documentation. | |
| 100 | Expected Result: Hardware or software modification is ready for installation. | |
| 110 | SMC Computer Operator: Run test procedure for the system modification. | |
| 120 | Expected Result: Test is passed. This resolves the DR. The documentation is accepted and the CCB is notified. | |
| 130 | SMC Operations Supervisor: Notify the operations personnel and affected users of the hardware or software resolution and installation schedule prior to installation. | |
| 140 | Expected Result: Notification is served and the modification is installed. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.4.3 Logistics Management Sequence

This sequence reviews SMC capabilities for managing system-level logistics management activities and for managing system-level personnel and resources in logistics control activities. The sequence confirms the SMC's abilities for developing and updating a system-level logistics management database containing historical, current and planned logistics commitments. The site abilities are confirmed for monitoring, statusing and reporting to SMC on site activities in response to logistics related directives.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other SMC sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the SMC Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Resource Controller

SMC Computer Operator

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the SMC Project: Release-A, used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--------------------|----------|
| none | | |

8.4.3.1 Logistics Monitoring

| | | | | | |
|--|--------------------|---|----------------------------|------------------------|--|
| TEST Procedure No.: A080430.010\$\$ | | Date Executed: | | Test Conductor: | |
| Title: Logistics Monitoring | | | | | |
| Objective: This test case verifies that the SMC has the capability to monitor the spares and consumables inventory. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| SMC-2300#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall monitor the spares inventory within each element.</p> <p>At the SMC, this procedure reviews the processes for accessing and monitoring the inventory status data base for each site.</p> <p>Performed by M&O staff using phone and access to site's inventory status database. Applicable inventory management tools are ClearCase and Baseline Management.</p> | | | |
| SMC-2320#A | | <p>The test verification method used is demonstration</p> <p>The SMC shall monitor the consumable inventory within each element for items used by the system including, at a minimum:</p> <ul style="list-style-type: none"> a. Computer tapes b. Computer disks c. Computer paper <p>At each site, this procedure records the quantity and status of three consumable items (computer tapes, computer disks, and computer paper) and one spare part as contained in the data base.</p> <p>Performed by M&O staff using phone and access to site's inventory status database</p> | | | |
| Test Inputs: inventory status data base containing information on consumables and spare parts from each site. | | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version | |
| INS 001 | | | inventory status data base | | |
| | | | | | |

| Step-By-Step Procedures | | |
|---|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Computer Operator: Open the Inventory file management directory. | |
| 20 | Expected Result: Inventory file is ready for access. | |
| 30 | SMC Computer Operator: Using the SMC logistics monitoring procedure information, track the location, quantity, status, and consumption rate concerning spares and consumables at the sites. | |
| 40 | SMC Computer Operator: Manually input the required list of consumables and spare part to be displayed (computer tapes, disks, and paper). Record the quantity and status of three consumable items (computer tapes, computer disks, and computer paper) as contained in the data base. | |
| 50 | Expected Result: All required characteristics for running the query is recorded and processed. | |
| 60 | SMC Computer Operator: A physical inspection of the inventory is made at the site to obtain the actual quantity and status of the three consumable items. | |
| 70 | Expected Result: The inventory list of the computer consumables and spare part is the same as the result of the physical inspection. | |
| 80 | SMC Computer Operator: Compare the computer generated inventory list with the test input supplied list. | |
| 90 | Expected Result: There is no discrepancies between the data base information and the quantity and status of consumable items and spare parts actually available at the site. | |
| 100 | SMC Computer Operator: Record any missing inventory or discrepancy in the evaluation report. The lists should compare. | |
| 110 | Expected Result: The lists compare. | |
| Data Reduction and Analysis Steps: There should be no discrepancies between the data base information and the quantity and status of consumable items and spare parts actually available at each site. The data base at the SMC should reflect the actual quantity and status of items for all sites. | | |
| Signature: | | Date: |

8.4.3.2 Logistics Replenishment

| | | | | |
|---|-----------------------|---|----------------------------------|----------------|
| TEST Procedure No.: A080430.020\$S | Date Executed: | | Test Conductor: | |
| Title: Logistics Replenishment | | | | |
| Objective: This test case verifies that the SMC has the capability to oversee the replenishment of spare parts and consumable items. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2310#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall oversee the replenishment of spare parts for all elements. At the SMC this test case reviews the procedures for overseeing and managing, respectively, the replenishment of spare parts and consumable items.</p> <p>Performed by M&O staff using phone and access to site's inventory status database.</p> | | |
| SMC-2330#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall monitor the replenishment of consumable items for all elements.</p> <p>The SMC assesses procedures for actions to be taken when stock levels fall below reorder points. At each site, the SMC is notified that the current quantities of consumable items (computer tapes, computer disks, and computer paper) and critical spare parts have just fallen to one less than their respective reorder points. The quantity of these items as contained in the data base is recorded. In the case of the SMC, this information is recorded for all sites. Each site uses logistics replenishment procedures to change the data base to reflect the decreased quantities of items.</p> <p>Performed by M&O staff using phone and access to site's inventory status database.</p> | | |
| Test Inputs: Spare parts and consumable items file from each site. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| SPC 001 | | | spare parts and consumable items | |

| Step-By-Step Procedures | | |
|--|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Resource Controller: Review the procedures for overseeing and managing, respectively, the replenishment of spare parts and consumable items. | |
| 20 | SMC Computer Operator: Open the Inventory file management directory. | |
| 30 | Expected Result: Inventory file is ready for access. | |
| 40 | SMC Computer Operator: Bring up the data base and change the current quantities of consumable items accordingly. | |
| 50 | SMC Computer Operator: Manually input the required list of consumables and spare part to be displayed (computer tapes, disks, and paper). | |
| 60 | Expected Result: All required characteristics for running the query is recorded and processed. | |
| 70 | SMC Computer Operator: List the consumables and spare part. | |
| 80 | Expected Result: The inventory list of the computer consumables and spare part is displayed. | |
| 90 | SMC Resource Controller: Check consumable and spare part list for shortfalls. | |
| 100 | Expected Result: If a shortfall exists an alert or warning message will be generated and displayed. No shortfalls should exist. | |
| 110 | SMC Resource Controller: Order any shortfall item. | |
| 120 | Expected Result: Change in the data base to indicate the items have been ordered. | |
| 130 | SMC Resource Controller: Record any discrepancy in the new inventory list. | |
| Data Reduction and Analysis Steps: Information gathered from the data base at each site with that gathered at the SMC is compared. In all cases, the data base at the SMC should reflect the same information as that contained in the corresponding LSM data bases. | | |
| Signature: | | Date: |

8.4.4 Training Management Sequence

This sequence provides the confirmation of SMC capabilities for managing system-level training and for supplying system-level personnel and courseware in performing on-site. The sequence confirms the established database architecture to confirm the SMC's ability for developing and updating a system-level training management information base containing historical, current and planned schedules courseware availability, training commitments and budgets pertaining to system training activities. The SMC training team's abilities are verified for specification of management activities for providing system-level assistance in managing site training. The LSMs at each

facility, are evaluated for the ability to receive training management directives and for monitoring, statusing and reporting to SMC on LSM activities in response to SMC originated training directives. The LSMs, at each facility, are evaluated for the ability to apply available SMC training resources within their assigned facilities. SMC procedures for monitoring and evaluating training course conduct and training effectiveness at the system and site levels are verified.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Resource Controller

SMC Computer Operator

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--------------------|----------|
| none | | |

8.4.4.1 ECS Training and Certification Program Management

| | | | | |
|---|-----------------------|---|--------------------|----------------|
| TEST Procedure No.: A080440.010SS | Date Executed: | Test Conductor: | | |
| Title: ECS Training and Certification Program Management | | | | |
| Objective: The Training and Certification Program Management test verifies that the ECS SMC training staff accesses the office automation tools required to develop plans for conducting training courses. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2400#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall support the management of training and certification programs for ECS.</p> <p>The SMC performs the following tasks for training, determining training requirements for various operator positions, tracking resources for training, and maintaining training course information.</p> | | |
| SMC-2410#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall provide support for the development of schedules for training courses.</p> <p>When determining training requirements for the sites, the SMC accesses the Certification Skills Catalog to identify the tasks and knowledge required, to effectively perform each specific DAAC ECS operation. The SMC then contacts the DAACs site ECS managers, via Email, to obtain information on the personnel training needs, the number of people requiring training, and any site unique training requirements. This information is collected and stored in the ECS on-line training database to assist the SMC in the organization and management of ECS training.</p> | | |
| Test Inputs: Training course schedule | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|--|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 30 | SMC Computer Operator: Login to ECS. | |
| 40 | SMC Computer Operator: Open the file from the SMC containing plans for conducting training and certification programs for ECS. | |
| 50 | Expected Result: File open and ready for access. | |
| 60 | SMC Resource Controller: Using the site information on the personnel training needs, the number of people requiring training, and unique training requirements. Query the database for the purpose of scheduling a training course. | |
| 70 | Expected Result: Information is collected from the training database. | |
| 80 | SMC Resource Controller: Schedule a training course. | |
| 90 | Expected Result: The SMC training staff contacts the site DAAC Resource Manager, via Email, to obtain information on the personnel training needs, and the number of people requiring training. | |
| 100 | SMC Resource Controller: Using the Training database, the information is accessed in the following planning activities: scheduling dates of training courses, developing training courses, scheduling training resources (system equipment, software, instructional materials), and scheduling personnel to support training. | |
| 110 | Expected Result: A training course is scheduled. | |
| 120 | SMC Resource Controller: The training database is updated with all of the scheduling information and formatted into a Training Schedule Report. | |
| 130 | Expected Result: The training schedule report is disseminated to the DAAC Resource Manager via the ECS training bulletin board as the proposed training schedule. Training registration for the course is done by Email. A confirmation of the training registration application is transferred via Email. | |
| Data Reduction and Analysis Steps: none | | |
| Signature: | | Date: |

8.4.4.2 On-the-Job Training

| | | | | |
|--|-----------------------|--|------------------------|----------------|
| TEST Procedure No.: A080440.020\$S | Date Executed: | | Test Conductor: | |
| Title: On-the-Job Training | | | | |
| Objective: The On-the-Job Training Test verifies that the site ECS managers are equipped to provide the tools necessary to train personnel in operation skills under actual working conditions, while tutored by a Subject Matter Expert (SME). | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-2420#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall support the development of on-the-job training.</p> <p>The tools required to conduct and support the development of on-the-job training are as follows: the Subject Matter Expert Handbook; the on-the-job Student Package; and the on-the-job Progress Records.</p> <p>Manually, except to the extent the staff opts to automate by using office automation tools.</p> | | |
| SMC-2430#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall support the development and use of training materials.</p> <p>The site ECS manager is provided with a Subject Matter Expert handbook that outlines the administrative procedures of the on-the-job program. The Subject Matter Expert uses the handbook for guidance on the instructions and details of training activities, and the evaluation of progress.</p> <p>Manually, except to the extent the staff opts to automate by using office automation tools.</p> | | |
| SMC-2450#A | | <p>The test verification method used is demonstration.</p> <p>The SMC shall support the evaluation of the effectiveness of the training programs.</p> <p>Upon completion of an on-the-job activity session the Subject Matter Expert references the Certification Skills Catalog to identify the Certification Test that is administered to the student for final evaluation. The result are recorded in the on-the-job Progress Record database, and submitted to the SMC via Email.</p> <p>Manually, except to the extent the staff opts to automate by using office automation tools.</p> | | |
| Test Inputs: | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Resource Controller: Review the Subject Matter Expert Handbook; the on-the-job Student Package; and the on-the-job Progress Records. | |
| 20 | SMC Resource Controller: Distribute to the site ECS managers the Subject Matter Expert handbook that outlines the administrative procedures of the on-the-job program. | |
| 30 | Expected Results: Sites have the Subject Matter Expert handbook that outlines the administrative procedures of the on-the-job program. | |
| 40 | SMC Resource Controller: Uses the handbook for guidance on the instructions and details of training activities, and the evaluation of progress of the trainee. | |
| 50 | SMC Resource Controller: Upon completion of an on-the-job activity session at the sites the Certification Skills Catalog is referenced to identify the Certification Test that is administered to the student for final evaluation. | |
| 60 | Expected Result: The result is recorded in the on-the-job Progress Record database at the site, and submitted to the SMC via Email. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.4.5 Inventory Management Sequence

This sequence provides the methodology for inspection of ECS capabilities for providing and maintaining a configuration management (CM) system, maintaining inventory data bases, managing the system-level inventory, and participating and contributing system-level skills and resources in performing site-level inventory activities. The sequence confirms the SMC's abilities for planning, establishing and maintaining a system-wide inventory of all hardware, science software, system software, and associated documentation within ECS.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Configuration Management(CM) Administrator

SMC Computer Operator

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--------------------|----------|
| none | | |

8.4.5.1 Inventory and Configuration Management

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.4.5.2 LSM Enhancement Migration and Inventory Management

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.4.5.3 SMC Inventory and Configuration Management

| | | |
|--|---|------------------------|
| TEST Procedure No.: A080450.010\$\$ | Date Executed: | Test Conductor: |
| Title: SMC Inventory and Configuration Management | | |
| Objective: This test case verifies that the SMC can establish and maintain a system-wide inventory data base of hardware, system software, and science software and provide a system wide configuration capability. | | |
| Requirements | Acceptance Criteria | |
| DADS1860#A | <p>The test verification method used is demonstration.</p> <p>Each DADS shall, in conjunction with the SMC, provide configuration management for its internal resources.</p> <p>At the SMC and each DADS, this test procedure reviews the documentation for maintaining the inventory of hardware, science software, and system software on a system-wide and site-specific basis.</p> | |
| SMC-2500#A | <p>The test verification method used is test.</p> <p>The SMC shall establish and maintain a system-wide inventory of all hardware, scientific and system software contained within ECS, including at a minimum:</p> <ol style="list-style-type: none"> Hardware or software identification numbers Version numbers and dates Manufacturer Part number | |

| | |
|------------|---|
| | <p>e. Serial number f. Name and locator information for software maintenance g. Location where hardware or software is used.</p> <p>At the SMC this test procedure reviews the documentation for maintaining the inventory of hardware, science software, and system software on a system-wide and site-specific basis. This information is used to bring up and access a data base, which contains CM information for hardware. The identification numbers, manufacturer, part number, and serial number of the actual hardware items is inspected.</p> <p>Performed by the staff using inventory system.</p> |
| SMC-2510#A | <p>The test verification method used is analysis.</p> <p>The SMC shall provide at a minimum system-wide configuration management for the operational hardware, scientific and system software, and the SMC toolkit contained within ECS. The management system shall support the migration of hardware and software upgrades into the operational environment.</p> <p>At the SMC this test procedure reviews the configuration management for maintaining the inventory of hardware, science software, system software, the SMC toolkit contained within ECS, and the migration of hardware and software upgrades into the operational environment.</p> |
| SMC-7300#A | <p>The test verification method used is test.</p> <p>The SMC shall establish, maintain, and update the authorized users inventory to include, at a minimum:</p> <ul style="list-style-type: none"> a. Users identifications b. Addresses c. Allowed privileges <p>This test procedure verifies that the SMC can establish, maintain, and update the authorized users inventory, which includes the users identifications, addresses, and their allowed privileges.</p> |
| SMC-7310#A | <p>The test verification method used is test.</p> <p>The SMC shall establish, maintain, and update the approved facility and equipment inventory to include, at a minimum:</p> <ul style="list-style-type: none"> a. Facility and equipment identification b. Addresses c. Allowed accesses to privileges <p>This test procedure verifies that the SMC can establish, maintain, and update the authorized users inventory, and the approved facility and equipment inventory. These inventories include the facility and equipment identification, addresses, and allowed accesses to privileges.</p> |
| SMC-7320#A | <p>The test verification method used is test.</p> <p>The SMC shall establish, maintain, and update the system profile, as opposed to science data profile, inventory to include, at a minimum:</p> <ul style="list-style-type: none"> a. Data identifications b. Data purposes c. Data locations d. Data classifications (proprietary, open, confidential, etc.) e. Data priorities <p>At the SMC this test procedure reviews the documentation for maintaining the inventory of the system profile. This information is used to bring up and access a data base, which contains CM information about data files. The identification, purpose, location, classification, and priority of the data file is inspected.</p> |

| Test Inputs: Documentation for maintaining the inventory of hardware, science software, and system software on a system-wide and site-specific basis. | | | | |
|--|--------------------|------------------|--|----------------|
| Data Set Name | Data Set ID | File Name | Description | Version |
| INV 001 | | | inventory of hardware, science software, and system software | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Configuration Management Administrator: Review the documentation for maintaining the inventory of hardware, science software, and system software on a system-wide basis. | |
| 20 | SMC Computer Operator: Log onto a workstation. | |
| 30 | Expected Results: Successful login. | |
| 40 | SMC Computer Operator: Bring up and access the data base, which contains CM information . | |
| 50 | SMC Configuration Management Administrator: Check for the established SMC created inventory and configuration management files, using the ClearCase tool. | |
| 60 | Expected Result: The files will be identified and located for input/output. | |
| 70 | SMC Configuration Management Administrator: Select data base information containing one hardware item . | |
| 80 | SMC Computer Operator: Print the inventory log file information for the one hardware item that contains the, hardware ID numbers, version numbers and dates, manufacturer, part number, and serial number. | |
| 90 | Expected Result: The inventory file will be printed. | |
| 100 | SMC Configuration Management Administrator: Inspect the identification numbers, manufacturer, part number, and serial number of the actual hardware item and record this information. | |
| 120 | Expected Result: The data base information compares with results of the hardware inspection. There should be no discrepancies between the information contained in the data base and the actual items selected for inspection. | |
| 130 | SMC Configuration Management Administrator: Select data base information containing one software item . | |
| 140 | SMC Computer Operator: Print the inventory log file information for the one software item that contains the, version numbers and dates, name and locator information for software maintenance, and the location where the software is used. | |
| 150 | Expected Result: The inventory file will be printed. | |
| 160 | SMC Configuration Management Administrator: Inspect the version numbers and dates, name and locator info for software maintenance, and the location where the software is used. | |
| 170 | Expected Result: The data base information compares with results of the software inspection. There should be no discrepancies between the information contained in the data base and the actual item selected for inspection. | |

Data Reduction and Analysis Steps:

At each site, the data base information is compared with results of the hardware and software inspection. There should be no discrepancies between information contained in the data base at the SMC and the data base at each site.

Signature:**Date:**

8.4.6 Quality Management Sequence

This sequence illustrates the SMC capabilities for establishing and maintaining quality assurance management data bases, for managing system-level quality assurance and for system-level quality assurance for overall ECS performance as well as for specific programmatic areas. The sequence also inspects site procedures to confirm their ability to perform quality assurance for the site, such as site quality testing, benchmarks, audits of site enhancement implementations, site quality checking, processed and delivered quality checks and quality evaluations of site resource usage performance.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Performance Analyst

SMC Computer Operator

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

Performance Management Activities (Section 3.5)

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--------------------|----------|
| none | | |

8.4.6.1 SMC Quality Assurance

| | | | | |
|--|-----------------------|--|--------------------|----------------|
| TEST Procedure No.: A080460.010\$\$ | Date Executed: | Test Conductor: | | |
| Title: SMC Quality Assurance | | | | |
| Objective: This test case verifies that the SMC has the capabilities to perform quality assurance activities. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-3340#A | | <p>The test verification method used is analysis.</p> <p>The SMC shall perform quality assurance for the overall ECS performance as well as programmatic areas that include, at a minimum:</p> <ul style="list-style-type: none"> a. System quality testing, benchmarks, and audits for system enhancement implementations b. System quality checking and audits of products processed and delivered c. Quality testing and audits of site and element resource performance. <p>This test procedure reviews QA policies and procedures for accomplishing system-wide QA activities, which include the following items: quality assurance for the overall ECS performance; system-level quality testing, benchmarks, and audits for system enhancement implementations at the DAACs; quality checking and audits of products processed and delivered; and quality testing and audits of site and element resource performance.</p> <p>Performed by M&O staff using various performance management tools.</p> | | |
| Test Inputs: QA policies and procedures (hard copies) | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Performance Analyst: Review the documentation for performing overall ECS quality assurance and inspect policies and procedures to ensure that quality testing, benchmarks and audits for site-specific enhancement implementations can be successfully accomplished, and that the quality testing and audits of DAAC resource performance can be performed. | |
| 20 | Expected Result: The inspection and review of the documentation for performing overall ECS quality assurance is completed. | |
| 30 | SMC Computer Operator: Log onto a workstation. | |
| 40 | Expected Results: Successful login. | |
| 50 | SMC Performance Analyst: Check the system for performance management tools. | |
| 60 | Expected Results: The performance management tools are present on the system (OpenView and Tivoli). | |
| Data Reduction and Analysis Steps: Inspection of the policies and procedures are performed to ensure that the SMC can do QA audits on a periodic basis to ensure adherence to established standards and procedures for hardware, software and operations. | | |
| Signature: | | Date: |

8.4.6.2 LSM Quality Assurance

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.4.7 Policies & Procedures Management Sequence

This sequence conducts an inspection of ECS procedures and policies for supporting, controlling and maintaining ECS policies and procedures covering site responsibility and authority, resource management, fault recovery, testing, simulation, maintenance, logistics, performance evaluation, training, quality and product issuance, inventory management, system enhancements, finance management, and administrative actions.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

SMC Operations Supervisor

SMC Configuration Management (CM) Administrator

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

Fault Management Activities (Section 3.3)

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|----------------------------------|--------------|
| A080480.010\$\$ | A080480.010\$G A080480.010\$L | concurrently |
| A080480.020\$\$ | A080480.020\$G A080480.020\$L | concurrently |

8.4.7.1 Policies and Procedures Control

| | | |
|---|--|------------------------|
| TEST Procedure No.: A080480.010\$\$ | Date Executed: | Test Conductor: |
| Title: Policies and Procedures Control | | |
| Objective: This test case verifies the overall support and control of policies and procedures affecting the ECS. | | |
| Requirements | Acceptance Criteria | |
| EOSD1990#A | The test verification method used is analysis. The ECS system and elements shall employ security measures and techniques for all applicable security disciplines which are identified in the preceding documents. These documents shall provide the basis for the ECS security policy. As determined in the technical security planning policy activity documented in EOSD2100. | |
| EOSD2100#A | The test verification method used is inspection. The ECS technical security policy planning shall be comprehensive and shall cover at least the following areas: a. Applicability of the C2 Level of Trustedness as defined by the NSA b. Applicability of the C2 Object Reuse capability c. Discretionary control and monitoring of user access d. ECS communications, network access, control, and monitoring e. Computer system "virus" monitoring, detection, and remedy f. Data protection controls g. Account/privilege management and user session tailoring h. Restart/recovery i. Security audit trail generation | |

| | |
|------------|---|
| | <ul style="list-style-type: none"> j. Security analysis and reporting k. Risk analysis <p>Compliance demonstrated in DID 214/SE1.</p> |
| EOSD2200#A | <p>The test verification method used is inspection.</p> <p>Selection criteria meeting overall ECS security policies and system requirements shall be applied when selecting hardware.</p> <p>Compliance demonstrated in DID 214/SE1.</p> |
| SMC-2600#A | <p>The test verification method used is inspection.</p> <p>The SMC shall support, control, and maintain ECS policies and procedures covering the following areas, at a minimum:</p> <ul style="list-style-type: none"> a. Site or element responsibility and authority b. Resource management c. Fault recovery d. Testing e. Simulation f. Maintenance g. Logistics h. Performance evaluation i. Training j. Quality and product assurance k. Inventory management l. System enhancements m. Finance management n. Administrative actions o. Security. <p>The test procedure confirms that the SMC establishes mechanisms and management processes for control of the following categories of ECS policy information: ECS and site-level responsibility and authority, resource management, fault recovery, testing, simulation, maintenance, logistics, performance evaluation, training, quality and product assurance, inventory management, system enhancements, finance management, administrative actions, and ECS security.</p> <p>Manually, except to the extent the staff opts to automate by using basic office automation tools.</p> |
| SMC-2620#A | <p>The test verification method used is inspection.</p> <p>The SMC shall maintain via the ECS bulletin board service, the SMC toolkit consisting of a list of SDPS approved CASE tools and references to standards for exchanging data for scientist use.</p> <p>Full capability.</p> |
| SMC-4300#A | <p>The test verification method used is demonstration.</p> <p>The SMC shall support, maintain, and update system fault management policies and procedures including, at a minimum:</p> <ul style="list-style-type: none"> a. Fault identification b. Fault priorities c. Recovery or corrective actions. <p>The test procedure confirms that the SMC establishes mechanisms for supporting, maintaining, and updating system fault management policies and procedures.</p> <p>Performed by M&O staff using office automation tools.</p> |
| SMC-5300#A | <p>The test verification method used is analysis.</p> <p>The SMC shall, in conjunction with sites and elements, establish, support, maintain, and update security policies and procedures to include, at a minimum:</p> <ul style="list-style-type: none"> a. Physical security b. Password management |

| | | | | |
|---|--|-----------|-------------|---------|
| | <p>c. Operational security d. Data security e. Privileges f. Network security g. Compromise mitigation.</p> <p>The test procedure confirms that the SMC establishes mechanisms for supporting, maintaining, and updating security policies and procedures.</p> <p>Performed by M&O staff using office automation tools or IMS-style text management.</p> | | | |
| SMC-6300#A | <p>The test verification method used is analysis.</p> <p>The SMC shall support, maintain, and update accountability policies and procedures based on ESDIS Project policies and procedures.</p> <p>The test procedure confirms that the SMC receives system-level policies from ESDIS, that these policies as well as procedures and guidelines are incorporated into SMC directives, and that these directives are disseminated to the DAACs, the EOC, and supporting sites as required.</p> <p>Partial - Performed by M&O staff using office automation tools.</p> | | | |
| Test Inputs: ESDIS/ECS policies and procedures for Site or element responsibility and authority, Resource management, Fault recovery, Testing, Simulation, Maintenance, Logistics, Performance evaluation, Training, Quality and product assurance, Inventory management, System enhancements, Finance management, Administrative actions, and Security. (hard copies) | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |
| | | | | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Configuration Management Administrator: Confirm that the site receives system-level policies from the SMC. Verify that principal ECS operational functions at the site are provided for in the management and control of ESDIS/ECS policies and procedures. | |
| 20 | Expected Result: The inspection is completed. The site receives system-level policies from the SMC is confirmed. Verification of the operational functions at the site are provided for in the management and control of ESDIS/ECS policies and procedures. | |
| 30 | SMC Configuration Management Administrator: Verify through inspection that the security management policies and procedures at the sites include password management, operational security, data classification, access privileges, system hardware and software maintenance, and spare parts inventory guidelines. | |
| 40 | Expected Result: The inspection of the security management policies and procedures at the sites including password management, operational security, data classification, access privileges, system hardware and software maintenance, and spare parts inventory guidelines is completed. | |
| 50 | SMC Configuration Management Administrator: Confirms that the LSM uses methods and procedures appropriate for controlling policies and procedures as well as pertinent correspondence at the system-wide and site level, respectively. | |
| 60 | Expected Result: The inspection confirms that the LSM uses methods and procedures appropriate for controlling policies and procedures as well as pertinent correspondence at the system-wide and site level, respectively. | |
| 70 | SMC Configuration Management Administrator: Confirm that the policies and procedures are sufficiently expanded to provide a level of detail necessary for implementation at the site. | |
| 80 | Expected Results: Inspections and confirmations are successful. For specifics refer to DID611 and Zi014-00 Security Policy. | |
| 90 | SMC Configuration Management Administrator: Verify through inspection that the ECS security policy covers the following areas, C2 level of security, communications, virus monitoring, protection controls, system restart/recovery, security audit trail generation, security analysis and reporting, and risk analysis. | |
| 100 | Expected Results: Inspection is successful. Specifics about compliance is demonstrated in DID 214/SE1. | |

| | | |
|---|--|--------------|
| 110 | SMC Configuration Management Administrator: Verify through inspection that the security section within all documents at the sites are current with the ECS approved documentation. | |
| 120 | Expected Results: Inspection shows that the security section within all documents at the sites are current with the ECS approved documentation. | |
| 130 | SMC Configuration Management Administrator: Verify that backup copies of the policy and procedure manuals are maintained at a separate physical location at the sites. | |
| 140 | Expected Results: Verification shows that backup copies of the policy and procedure manuals are maintained at a separate physical location at the sites. | |
| Data Reduction and Analysis Steps: | | |
| The test confirms that the SMC and LSM uses methods and procedures appropriate for controlling policies and procedures. | | |
| Signature: | | Date: |

8.4.7.2 Policies and Procedures Maintenance

| | | | | | |
|---|--|---|------------------|------------------------|----------------|
| TEST Procedure No.: A080480.020\$\$ | | Date Executed: | | Test Conductor: | |
| Title: Policies and Procedures Maintenance | | | | | |
| Objective: This test case verifies that the SMC provide a bulletin board service with information on ECS status, events, and news so that ESDIS, SMC, and LSM policies and procedures and directives can be properly maintained and distributed. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| SMC-2610#A | | The test verification method used is demonstration. The SMC shall provide and maintain a bulletin board service with information on ECS status, events, and news. This procedure tests that the SMC provide a bulletin board service with information on ECS status, events, and news so that ESDIS, SMC, and LSM policies and procedures and directives can be properly maintained and distributed. Partial compliance - performed by M&O staff using various office automation, CM, and other tools. | | | |
| SMC-3300#A | | The test verification method used is demonstration. The SMC shall monitor site and element hardware status to determine their operational states including, at a minimum: a. On-line b. Failed c. In maintenance d. In test mode e. In simulation mode This test procedure confirms that the SMC establishes mechanisms for monitoring site and element hardware status to determine their operational states. | | | |
| Test Inputs: ECS status, events, and news | | | | | |
| Data Set Name | | Data Set ID | File Name | Description | Version |
| | | | | bulletin board | |

| Step-By-Step Procedures | | |
|--------------------------------|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Operations Supervisor: Login to the system. | |
| 20 | Expected Result: Successful logon. | |
| 30 | SMC Operations Supervisor: Obtain proper ECS authority to update policies. | |
| 40 | Expected Result: The Tester has the responsibility and authority to access and update information in policies and procedures, and directives. | |
| 50 | SMC Operations Supervisor: Enter the QA data base directory for read/write. | |
| 60 | Expected Result: Entry to the QA system. | |
| 70 | SMC Operations Supervisor: Query the QA data base for on line policies and procedures, and directives. | |
| 80 | Expected Result: A listing of the current policies, procedures, and directives is displayed. | |
| 90 | SMC Operations Supervisor: From the listing find the names for the policies, procedures, and directives for performance evaluation, and quality and product assurance. | |
| 100 | SMC Operations Supervisor: Query the policy for performance evaluation and list the policy status. | |
| 110 | SMC Operations Supervisor: Check known status with the computer generated policy status. | |
| 120 | Expected Result: The status information compares. | |
| 130 | SMC Operations Supervisor: Using the office automation tools display the performance evaluation policy. | |
| 140 | Expected Result: The performance evaluation policy is displayed. | |
| 150 | SMC Operations Supervisor: Using the office automation tools, change a paragraph in the policy and store the document back into the QA data base. | |
| 160 | Expected Result: The performance evaluation policy will be updated and maintained in the SMC data base. | |
| 170 | SMC Operations Supervisor: Close the QA data base. | |
| 180 | SMC Operations Supervisor: Enter the CM data base directory for read/write. | |
| 190 | Expected Result: Entry to the CM system. | |
| 200 | SMC Operations Supervisor: Query the CM data base for on line policies and procedures, and directives. | |
| 210 | Expected Result: A listing of the current policies, procedures, and directives is displayed. | |

| | | |
|---|---|--------------|
| 220 | SMC Operations Supervisor: From the listing find the names for the policies, procedures, and directives for element responsibility and authority, resource management, fault recovery, testing, simulation, maintenance, logistics, training, inventory management, system enhancements, finance management, administrative actions, and security | |
| 230 | SMC Operations Supervisor: Query the policy for performance evaluation and list the directive status for training. | |
| 240 | SMC Operations Supervisor: Check known status with the computer generated directive status. | |
| 250 | Expected Result: The status information compares. | |
| 260 | SMC Operations Supervisor: Using the office automation tools display the training directive. | |
| 270 | Expected Result: The training directive is displayed. | |
| 280 | SMC Operations Supervisor: Using the office automation tools, change a paragraph in the directive and store the document back into the CM data base. | |
| 290 | Expected Result: The training directive will be updated maintained in the SMC data base. | |
| 300 | SMC Operations Supervisor: Close the CM data base. | |
| 310 | SMC Operations Supervisor: Demonstrate the capability of the LSM to provide, via the ECS bulletin board service, a toolkit consisting of a list of approved CASE tools and references to standards for exchanging data for science use. | |
| 320 | Expected Result: Successful demonstration. | |
| 330 | SMC Operations Supervisor: Log on to the bulletin board server. | |
| 340 | Expected Result: Bulletin board service is initialized. | |
| 350 | SMC Operations Supervisor: Scroll down the bulletin board list for information on ECS status, events, and news. Open the ECS status bulletin board. | |
| 370 | Expected Result: A list of the ECS status messages is displayed. | |
| 380 | SMC Operations Supervisor: Select a message. | |
| 390 | Expected Result: The message is displayed. | |
| 400 | SMC Operations Supervisor: Quit. | |
| 410 | Expected Result: Exit the bulletin board. | |
| 420 | SMC Operations Supervisor: Reset all changed files back to their original state. | |
| 430 | Expected Result: All changed files are set back to their original state. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.4.8 Network Management Sequence

This sequence provides the AT reviewer with guidance for confirming the ECS ability to support, control and maintain ECS network management information such as network configuration management, network fault management, network performance management, network security management at the SMC. ECS network configuration management functions are inspected. Procedures for interoperability with the NSI to provide user access to the ECS are inspected.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: There are no external interface needed to perform this sequence of tests.

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support this sequence are listed:

SMC Network Analyst
SMC Computer Operator
SMC System Administrator
SMC Resource Controller

Operational Scenario: The following scenarios, taken from Operations Scenarios for the ECS Project: Release-A (605/OP1), are used during this sequence of tests.

System Status Scenario (Section 3.14.3)

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.4.8.1 Network Configuration and Status

| | | |
|--|--|------------------------|
| TEST Procedure No.: A080490.010\$\$ | Date Executed: | Test Conductor: |
| Title: Network Configuration and Status | | |
| Objective: The Network Status Test confirms the ability of the SMC staff to obtain configuration management information and the status of system wide network resources, including data flow status information. Services provided by ECS include collecting information describing the state of the network subsystem and its communications resources. This test also verifies the ability to perform management functions which exercise control over the network configuration, parameters, and resources. These functions include access to and manipulation of network resources. | | |
| Requirements | Acceptance Criteria | |
| EOSD0780#A | This requirement is verified through demonstration. Each element shall be capable of being monitored during testing. The Tester must obtain system status using HP OpenView. | |
| ESN-0620#A | This requirement is verified through test. The ESN shall include a network management function to monitor and control the ESN. The Tester must verify that HP OpenView provides the ability to monitor | |

| | |
|------------|--|
| | and control the network. |
| ESN-0640#A | <p>This requirement is verified through test.</p> <p>The ESN shall include management functions at each ECS element, equipment or gateway within the ESN.</p> <p>The MSS Discovery Service must discover (via network protocol) new instances of managed objects, detect missing occurrences of managed objects, and report missing occurrences of managed objects.</p> |
| ESN-0650#A | <p>This requirement is verified through test.</p> <p>The ESN shall perform the following network management functions for each protocol stack implemented in any ECS element, and each communications facility:</p> <ol style="list-style-type: none"> Network Configuration Management Network Fault Management Network Performance Management Network Security Management <p>The Tester must utilize HP OpenView to obtain information on the system configuration and changes in the system configuration. This test does NOT verify parts b, c and d of the requirement.</p> |
| ESN-0690#A | <p>This requirement is verified through test.</p> <p>The ESN shall be capable of reconfiguration transparent to network users.</p> <p>Needs further investigation. On ESDIS List.</p> |
| ESN-0750#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide statistical processing capabilities to allow extraction and tabulation of network performance data.</p> <p>The MSS performance management application service must log ECS performance data pertaining to ECS network components and operating system resources.</p> |
| ESN-0780#A | <p>This requirement is verified through test.</p> <p>The network elements including the Internet interfaces, shall have the capability to report, periodically and on an interactive basis, network statistics to the ESN network management function, including the following information:</p> <ol style="list-style-type: none"> Network round trip delay Network reset and restart indications Outages and CRC errors Performance statistics <p>The ISS physical components, and services must have the capability to be monitored via SNMP agents. This test does NOT verify part d of this requirement.</p> |
| ESN-0790#A | <p>This requirement is verified through test.</p> <p>The ESN shall include the following configuration management functions at a minimum:</p> <ol style="list-style-type: none"> collect information describing the state of the network subsystem and its communications resources, exercise control over the configuration, parameters, and resources of the subsystem, and over the information collected, store the configuration information collected, and display the configuration information <p>The MSS Maps/Collection Service must retain the status of managed objects and their relationship to symbols that comprise a graphical representation of the physical network topology. The MSS Fault Management Application Service must provide the capability to create, modify, delete and display graphical representations of a given network topology.</p> |

| | |
|------------|--|
| ESN-0800#A | <p>This requirement is verified through test.</p> <p>The ESN shall be capable of displaying the local network configuration status related to each system locally, and for all systems at the ESN network management facility.</p> <p>The MSS must be capable of displaying the local network configuration status related to each system locally, and for all systems at the network management facility.</p> |
| ESN-1030#A | <p>This requirement is verified through demonstration.</p> <p>The ESN shall perform periodic testing of alternate communication capabilities to verify that they are operational.</p> <p>The Tester must demonstrate multiple tests of the communications system.</p> |
| ESN-1060#A | <p>This requirement is verified through test.</p> <p>The ESN performance management function shall provide the capability to evaluate the performance of ESN resources and interconnection activities.</p> <p>The MSS performance management application service must be capable of receiving operational state change notifications from network components, hosts, applications, and peripherals.</p> |
| ESN-1070#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide the capability to perform the following functions, at a minimum:</p> <ul style="list-style-type: none"> a. generate/collect network statistics b. control collection/generation of network statistics c. store system statistics and statistical histories d. display the system statistics e. track end-to-end transaction performance. <p>The Tester must generate, control, display and store system and network statistics.</p> <p>This test does NOT verify part e of this requirement.</p> |
| ESN-1140#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide protocol translation, termination, bridging and routing.</p> <p>The Tester performs IP, UDP, and SNMP protocol tests demonstration the ability to translate between multiple protocols. The Tester identifies bridges and routers using HP OpenView's configuration topology map.</p> |
| ESN-1330#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide ISO/OSI data communications protocols and services specified in the GOSIP (see Figure 8-3) to external interfaces as required by the IRDs.</p> <p>The CSS must support the TCP and UDP communication protocols to communicate between the servers and the clients. The GOSIP services are not required in Release A.</p> |
| ESN-1340#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide support for TCP/IP communications protocols and services to external interfaces as required by the IRDs.</p> <p>The MSS must support TCP/IP communications protocols and services to external interfaces as required by the IRDs.</p> <p>The GOSIP services are not required in Release A.</p> |
| NSI-0020#A | <p>This requirement is verified through test.</p> <p>NSI shall provide support for TCP/IP communication protocols and services to ESN.</p> <p>The NSI must support TCP/IP communications protocols and services to GSFC as required by the IRDs</p> |

| | |
|------------|--|
| SMC-3300#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall monitor site and element hardware status to determine their operational states including, at a minimum:</p> <ul style="list-style-type: none"> a. On-line b. Failed c. In maintenance d. In test mode e. In simulation mode <p>The MSS Maps/Collection Service must retain the status of managed objects and their relationship to symbols that comprise a graphical representation of the physical network topology.</p> |
|------------|--|

| Step-By-Step Procedures | | |
|--------------------------------|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Resource Manager: Log on to MSS Server as an administrator | |
| 20 | Expected Results: MSS Server available with administrator account access | |
| 30 | Resource Manager: Execute the HP OpenView application. | |
| 40 | Expected Results: HP OpenView window is displayed on the screen. The HP OpenView window displays a map depicting the DAAC configuration. | |
| 50 | Resource Manager: Identify routers and gateways depicted in the map. | |
| 60 | Expected Results: The routers and gateways are displayed in the map. | |
| 70 | Resource Manager: Initialize an application being monitored by HP OpenView. | |
| 80 | Expected Result: The application is initialized. | |
| 90 | Resource Manager: Verify that the system recognizes the monitoring of the application. | |
| 100 | Expected Result: The system recognizes the monitoring of the application. | |
| 110 | Resource Manager: Exit from the application and verify that the system depicts the change. | |
| 120 | Expected Result: The change is depicted by the system. | |
| 130 | Resource Manager: Make HP OpenView's window active by clicking on it. | |
| 140 | Expected Result: HP OpenView's window is active. | |
| 160 | Resource Manager: Perform an IP protocol test. | |
| 170 | Expected Result: HP OpenView verifies the use of IP protocol communications. | |
| 180 | Resource Manager: Perform a TCP protocol test. | |
| 190 | Expected Result: HP OpenView verifies the use of TCP protocol communications. | |
| 200 | Resource Manager: Perform an UDP protocol test. | |
| 210 | Expected Result: HP OpenView verifies the use of UDP protocol communications. | |
| 220 | Resource Manager: Perform an SNMP protocol test. | |
| 230 | Expected Result: HP OpenView verifies the use SNMP protocol communications. | |
| 240 | Resource Manager: Clicks on the HP OpenView Network Node Manager (NNM) icon on the workbench. | |
| 250 | Expected Results: Network Node Manager application starts up and shows the NNM prototype screen 1. | |
| 260 | Resource Manager: Clicks on the GSFC ECS DAAC icon. | |

| | | |
|-----|--|--|
| 270 | Expected Results: The NNM prototype screen 2 displays the icons for the GSFC ECS DAAC resources including the science data server. | |
| 280 | Resource Manager: Clicks on the GSFC ECS DAAC science data server. | |
| 290 | Expected Results: The NNM prototype screen 3 indicates that the GSFC ECS DAAC science data server is restarting by displaying the icon as red. | |
| 300 | Resource Manager: Reviews the Trouble Ticket for the GSFC ECS DAAC science data server. | |
| 310 | Expected Results: The Trouble Ticket gives the down time information. | |
| 320 | Resource Manager: Continues to monitor the status as the server completes its restart. | |
| 330 | Expected Results: The NNM prototype screen 3 displays the change in the server icon to green. | |
| 340 | Resource Manager: Connect a hardware device to the network (e.g. a printer). Activate the NNM prototype screen 1 by clicking on the window. | |
| 350 | Expected Result: The NNM prototype screen 1 is active. | |
| 360 | Resource Manager: Clicks on the SMC icon. | |
| 370 | Expected Results: The NNM prototype screen 2 displays the icons for the SMC resources. | |
| 380 | Resource Manager: Adds and configures an icon for the new printer. | |
| 390 | Expected Results: The system recognizes the printer. | |
| 400 | Resource Manager: Clicks on the printer. | |
| 410 | Expected Results: The NNM prototype screen 3 indicates that the printer is offline by displaying the icon as red. | |
| 420 | Resource Manager: Pushes the on-line button on the printer. | |
| 430 | Expected Results: The printer icon changes to green indicating that it has recognized the printer's change in status. | |
| 440 | Resource Manager: Turn off the power to the hardware device. Verify that the system recognized the new configuration. | |
| 450 | Expected Result: The NNM prototype screen 3 indicates that the printer has failed by displaying the icon as red. | |
| 460 | Resource Manager: Turn the power back on for the hardware device. Verify that the system recognized the new configuration. | |
| 470 | Expected Result: The NNM prototype screen 3 indicates that the printer is up by displaying the icon as green. | |
| 480 | Resource Manager: Disconnect the hardware device from the network. Verify that the system recognizes the new configuration. | |

| | | |
|---|--|--------------|
| 490 | Expected Result: The NNM prototype screen 3 indicates that the printer has failed again by displaying the icon as red. | |
| 500 | Resource Manager: Change to the directory which contains the history log. | |
| 510 | Resource Manager: Examine the history log to determine whether the events have been documented. | |
| 520 | Expected Results: The events have been documented in the history log. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.4.8.2 Directory Service

| TEST Procedure No.: A080490.050\$\$ | Date Executed: | Test Conductor: |
|--|--|------------------------|
| Title: Directory Service | | |
| Objective: The purpose of this test is to verify the functionality of the Directory/Naming Service. The Directory/Naming Service uniquely associates a name with resources/principals, either physical or logical, along with some information so they can be identified and located by the name even if the named resource changes its physical address over time. | | |
| Requirements | Acceptance Criteria | |
| ESN-0010#A | <p>This requirement is verified through test.</p> <p>ESN shall provide the following standard services:</p> <ul style="list-style-type: none"> a. Data Transfer and Management Services b. Electronic Messaging Service c. Remote Terminal Service d. Process to Process Communication Service e. Directory and User Access Control Service f. Network Management Service g. Network Security and Access Control Service h. Internetwork Interface Services i. Bulletin Board Service <p>The Tester verifies the directory and user access control service by defining an attribute using the Directory/Naming Service.</p> <p>This test does NOT verify parts a, b, c, d, f, g, h, and i of the requirement.</p> | |
| ESN-0490#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide a name-to-attribute mapping Directory Service.</p> <p>The Tester verifies the name-to-attribute mapping by defining an attribute using the Directory/Naming Service.</p> | |
| ESN-0510#A | <p>This requirement is verified through test.</p> <p>The directory function shall be able to respond to requests for information concerning named objects, either physical or logical, so as to support communications with those objects.</p> <p>The Tester verifies the directory function by modifying an attribute definition using the Directory/Naming Service.</p> | |
| ESN-0590#A | <p>This requirement is verified through test.</p> <p>The ESN Directory Service shall be protected by access control capabilities.</p> <p>The CSS Security service must provide an API to verify the identity of users.</p> | |
| ESN-0600#A | <p>This requirement is verified through test.</p> <p>The ESN Directory service shall include services and supporting mechanisms to authenticate the credentials of a user for the purpose of granting access rights and authorizing requested operations.</p> <p>The CSS Security service must provide an API to check the authorization privileges of principals to access/control services/resources.</p> | |

| | | | | |
|---------------|--|-----------|----------------------------|---------|
| ESN-0610#A | <p>This requirement is verified through test.</p> <p>The ESN shall include multiple Directory Service Agents (DSAs) which are collectively responsible for holding or retrieving all directory information which is needed by ECS.</p> <p>The Tester verifies the directory and user access control service by defining an attribute using the Directory/Naming Service.</p> | | | |
| Test Inputs: | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| ATTR_001 | | | List of defined attributes | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Resource Manager: Login to Client | |
| 20 | Expected Results: Client Desktop displays on the screen. | |
| 30 | Resource Manager: Perform DCE login using a DCE account and password. | |
| 40 | Expected Result: The Computer Operator gains access to the DCE account. | |
| 50 | Resource Manager: Type cdsbrowser & to verify the directory naming activity. | |
| 60 | Expected Result: The directory naming activity is verified. | |
| 70 | Resource Manager: From the cdsbrowser, select an attribute and press Display . | |
| 80 | Expected Result: The system is displays the attributes currently entered into the system. | |
| 90 | Resource Manager: Select Attribute and press Display . | |
| 100 | Expected Results: A list of available attributes is displayed on the screen. | |
| 110 | Resource Manager: Select the attribute MSSAttr to read the attribute values. | |
| 120 | Expected Results: The MSSAttr attribute values are displayed on the screen. | |
| 130 | Resource Manager: Verify a list of attribute types. | |
| 140 | Expected Results: Each of the attributes is contained in the list. | |
| 150 | Resource Manager: Select Modify an Attribute . | |
| 160 | Expected Results: Access to modify an attribute is available. | |
| 170 | Resource Manager: Change the MSSAttr attribute to CSSAttr . | |
| 180 | Expected Results: The name of the MSSAttr attribute is changed to CSSAttr . | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.5 Performance Management Scenario

This scenario walks SMC operations personnel through the process of accessing and displaying system performance parameters and metrics. It carries the staff through a series of analytical and diagnostic sequences which demonstrate the system's capability to measure SMC performance and detect operational trends.

The Performance Management scenario's acceptance testing activity guides the reviewer in confirming those functions that provide global integrated ECS performance management services and exercise system-wide control. Verifying ECS metrics confirms ECS capability for defining meaningful measures, for developing and maintaining standard performance metrics, and for accomplishing system-level performance testing and performance improvement actions.

8.5.1 Metrics Sequence

This test sequence verifies the capability of the SMC to evaluate overall ECS system performance for a broad spectrum of activities including data collection and delivery, product generation, responses to user requests, and emergencies. The SMC capability to establish and maintain system-level metrics containing thresholds and multiple level limit-checking parameters is confirmed. Also confirmed is the SMC's ability to generate, maintain, and update performance criteria and responses to performance deficiencies for the system and the ECS sites. The SMC and the LSM capability to generate alert indicators for fault and degraded conditions is also confirmed..

Finally, the capability of the SMC to provide the required availability of key services and to repair failed capabilities within specified mean down times (MDTs) is confirmed.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): The external interfaces (i.e. other ECS sites and data sources) needed for a sequence (real and simulated external systems) are listed:

EOC

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support a sequence are listed:

DAAC Production Monitor

SMC Performance Analyst

SMC Resource Controller

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

User Notes Performance Degradation (Section 3.5.2) - A080510.010\$\$

Operation Support Scenario (Section 3.5.1) - A080510.020\$\$

Test Dependencies: The following table identifies the test procedures in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|---|--|
| A080510.010\$\$ | EOC/A080510.010\$F GSFC/A080510.010\$G LaRC/A080510.010\$L EDC/A080510.010\$E | Concurrent Concurrent Concurrent Concurrent |
| A080510.020\$\$ | GSFC/A100230.020\$G GSFC/A100110.110\$G GSFC/A100110.060\$G LaRC/A090110.010\$L LaRC/A090110.020\$L LaRC/A090310.040\$L SMC/A080140.010\$\$ | Prior and re-run during A080510.020\$\$ |
| A080510.030\$\$ | SMC/A080510.020\$\$ | Concurrent |

8.5.1.1 Performance Metrics Establishment

| | | | | | |
|---|--------------------|---|--------------------|------------------------|----------------|
| TEST Procedure No.: A080510.010\$\$ | | Date Executed: | | Test Conductor: | |
| Title: Performance Metrics Establishment | | | | | |
| Objective: This test case verifies the capability of the SMC to establish, maintain and update system performance criteria and performance parameter limits and thresholds. The capability to establish multiple threshold levels, including on/off, pass/fail, and various levels of degradation is also confirmed. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| ESN-1090#A | | This requirement is verified through test. The ESN shall provide the capability to control the communications performance parameters of the network. On ESDIS List. | | | |
| SMC-3370#A | | This requirement is verified through test. For each performance parameter, the SMC shall have the capability of establishing multiple levels of thresholds to include, at a minimum: a. On/off b. Pass/fail c. Various levels of degradation Multiple levels of thresholds (on/off, pass/fail and various levels of degradation) for each performance parameter will be entered. | | | |
| Test Inputs: Required test case inputs include a list of ESDIS-specified performance parameters, specifications, and policies and procedures, as well as an operational script exercising different levels of performance to assess the capability to update and check limit and threshold parameters. | | | | | |
| Data Set Name | Data Set ID | File Name | Description | | Version |
| N/A | | | | | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Performance Analyst: Starts HP OpenView. | |
| 20 | Expected Result: OpenView window displays top level system map. | |
| 30 | SMC Performance Analyst: Selects an MSS managed host and sets two thresholds for CPU utilization, one to indicate degraded performance and the other to indicate failure. | |
| 40 | Expected Result: The new CPU utilization threshold values can be observed by examining the Management Information Base (MIB). | |
| 50 | SMC Performance Analyst: Starts a script to cause the CPU utilization to exceed the threshold for degraded performance but not to exceed the upper (failure) limit. | |
| 60 | Expected Result: The MSS managed host is running in a degraded state due to heavy CPU utilization. | |
| 70 | SMC Performance Analyst: Clicks on CPU LOAD option from HP OpenView for MSS managed host. | |
| 80 | Expected Result: HP OpenView displays a CPU LOAD Graph containing the average CPU load on that host. | |
| 90 | SMC Performance Analyst: Clicks on TIME INTERVAL option from HP OpenView menu for that host and scrolls back to the time period when the lower CPU utilization threshold is exceeded (but not the upper limit). | |
| 100 | Expected Result: HP OpenView displays a CPU LOAD Graph containing the raised CPU load level . | |
| 110 | SMC Performance Analyst: Starts a script to cause the upper limit threshold to be exceeded. | |
| 120 | Expected Result: System is running MSS managed host exceeding its upper limit CPU utilization threshold thus causing a failure on the MSS managed host. | |
| 130 | SMC Performance Analyst: Clicks on CPU LOAD option from HP OpenView for MSS managed host. | |
| 140 | Expected Result: HP OpenView displays a CPU LOAD Graph containing the average CPU load on that host. | |
| 150 | SMC Performance Analyst: Clicks on TIME INTERVAL option from HP OpenView menu for that host and scrolls back to the time period that the upper limit CPU utilization threshold is exceeded. | |
| 160 | Expected Result: HP OpenView displays a CPU LOAD Graph containing the upper level of CPU load exceeded the currently configured CPU threshold thus causing the MSS managed host to fail. The HP OpenView icon for the MSS managed host is in red. | |
| 170 | SMC Performance Analyst: Repeats steps 10 - 160 using the Memory utilization performance parameter. | |

| | | |
|---|---|--------------|
| 180 | Expected Result: As indicated in steps 10 - 160 but memory utilization now exceeds thresholds for degraded performance and later for failure. | |
| Data Reduction and Analysis Steps: Expected results include the verification of the capability of the SMC to establish, maintain and update system performance parameters and limit thresholds. The capability to monitor performance and to evaluate performance and any degradation with respect to these parameters will be confirmed. | | |
| Signature: | | Date: |

8.5.1.2 Performance Measurement and Degradation Response Capability

| | | | | |
|--|--|-----------------|-------------|---------|
| TEST Procedure No.: A080510.020\$\$ | Date Executed: | Test Conductor: | | |
| Title: | Performance Measurement and Degradation Response Capability | | | |
| Objective: | This test case verifies the capability of the SMC to assess overall ECS performance, including performance during data collection, archiving, and delivery, data reprocessing requests, user requests, and system emergencies. The SMC capabilities to generate alert indicators for fault or degraded conditions and to generate corrective actions in response to these faults or degradations are also confirmed. | | | |
| Requirements | Acceptance Criteria | | | |
| SMC-3350#A | <p>This requirement is verified through analysis.</p> <p>The SMC shall generate, maintain, and update performance criteria and responses to performance deficiencies for system, site, and element resources and activities, such as:</p> <ul style="list-style-type: none">a. Data collectionb. Product generation, QA and validationc. Reprocessingd. Data delivery to DAACs and to userse. Response to user requestsf. Response to TOOsg. Response to field experimentsh. Response to emergency situations <p>The performance management tools will be used to verify that the required performance criteria and responses to performance deficiencies in data collection, product generation, data delivery to DAACs and to users, etc., are generated and updated.</p> <p>Item (f) will not be verified in this sequence as it is part of Release B.</p> | | | |
| SMC-3390#A | <p>This requirement is verified through test.</p> <p>The SMC shall generate alert indicators of fault or degraded conditions with the corrective actions.</p> <p>The fault or degraded conditions of the system will be induced and it should result in alert indicators being generated and/or automatic corrective actions being taken.</p> | | | |
| Test Inputs: | Required test case inputs include a configuration file containing performance parameters and specifications, and an operational script for exercising and simulating faults and degraded performance conditions. ESDIS policies and procedures specifying the range of responses and corrective actions to faults and performance degradation are also needed. | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| N/A | | | | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Performance Analyst: Starts the Management Information Base (MIB) initialization program using the input configuration file. | |
| 20 | Expected Result: The performance thresholds and system responses specified in the input configuration file are generated. | |
| 30 | SMC Performance Analyst: Clicks on HP OpenView Browse MIB option. | |
| 40 | Expected Result: HP OpenView shows the performance thresholds and system responses specified in the input configuration file. | |
| 50 | DAAC Production Monitor: Starts a production run of a PGE process on DMGHW-GSFC-2 that uses excessive disk space and causes the free space on DMGHW-GSFC-2 to fall below the threshold. | |
| 60 | Expected Result: A warning message indicating that free disk space on DMGHW-GSFC-2 has fallen below the threshold is displayed on the SMC operator's screen. | |
| 70 | SMC Performance Analyst: Double clicks on the GSFC icon on HP OpenView . | |
| 80 | Expected Result: HP OpenView displays GSFC submap. | |
| 90 | SMC Performance Analyst: Clicks on DMGHW-GSFC-2 icon. | |
| 100 | Expected Result: HP OpenView highlights the icon. | |
| 110 | SMC Performance Analyst: Selects the Browse MIB option to determine the problem. | |
| 120 | Expected Result: HP OpenView shows information on various MIB parameters, including degraded state of disk free space. | |
| 130 | SMC Performance Analyst: Graphs available disk free space data. | |
| 140 | Expected Result: HP OpenView graph capability shows that there has been excessive disk utilization since the process of Step 50 was started. | |
| 150 | DAAC Production Monitor: Terminates the process started in Step 50. | |
| 160 | Expected Result: The PGE process is terminated. | |
| 170 | DAAC Production Monitor: Saves the associated disk file to temporary storage. | |
| 180 | Expected Result: The disk file is backed up. | |
| 190 | DAAC Production Monitor: Deletes the associated disk file. | |
| 200 | Expected Result: The disk file is deleted. | |

| | | |
|-----|---|--|
| 210 | SMC Performance Analyst: Clicks on HP OpenView Browse MIB option. | |
| 220 | Expected Result: HP OpenView shows that DMGHW-GSFC-2 disk free space is no longer in a degraded state. | |
| 230 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 240 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 250 | SMC Performance Analyst: For Data Collection activity, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 260 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 270 | SMC Performance Analyst: Starts Data Collection activity. Note: Run A090110.010\$L | |
| 280 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 290 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 300 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 310 | SMC Performance Analyst: For product generation, QA and validation activities, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 320 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 330 | SMC Performance Analyst: Starts product generation, QA and validation activities. Note: Run A100230.020\$G and A090110.020\$L | |
| 340 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 350 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 360 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 370 | SMC Performance Analyst: For reprocessing activity, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 380 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 390 | SMC Performance Analyst: Starts reprocessing activity. Note: Run A090310.040\$L. | |
| 400 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 410 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |

| | | |
|-----|---|--|
| 420 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 430 | SMC Performance Analyst: For data delivery to DAACs and users, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 440 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 450 | SMC Performance Analyst: Starts data delivery to DAACs and users activity. Note: Run A100110.110\$G. | |
| 460 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 470 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 480 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 490 | SMC Performance Analyst: For response to user requests, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 500 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 510 | SMC Performance Analyst: Starts response to user requests activity. Note: Run A100110.060 - 110\$G. | |
| 520 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 530 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 540 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 550 | SMC Performance Analyst: For response to field experiments, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |
| 560 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 570 | SMC Performance Analyst: Starts response to field experiments activity. | |
| 580 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| 590 | SMC Performance Analyst: Clicks on the HP OpenView Update MIB option. | |
| 600 | Expected Result: HP OpenView displays current values for MIB parameters. | |
| 610 | SMC Performance Analyst: For response to emergency situations, updates performance criteria for response time, updates deficiency response to change color of the icon for the node responsible for the activity. | |

| | | |
|---|--|--------------|
| 620 | Expected Result: Inspection of the MIB shows that the information has been updated. | |
| 630 | SMC Performance Analyst: Starts response to emergency situations. Run: A080140.010\$\$. | |
| 640 | Expected Result: When the specified response time is exceeded, the specified icon will change color. | |
| Data Reduction and Analysis Steps: Expected Results include the verification of the capability of the SMC to monitor performance and to generate corrective actions for performance degradation and system faults. The site history log is examined to verify that it records the results from this test procedure. A printed summary of the Management Information Base (MIB) is compared with the input configuration file to verify that the performance criteria and responses to performance deficiencies are correctly generated. | | |
| Signature: | | Date: |

Table 8-1. RMA Capabilities

| ECS Segment | ECS Function or Service Provided | Minimum Availability/Maximum MDT |
|--------------------|--|---|
| Overall | System-level Functions and Services | 0.96/ 4 hr's. |
| CSMS | SMC Capability to Gather and Disseminate System Management Information (for critical services) | 0.998/ 20 min. |

8.5.1.3 RMA Assurance Test and Analysis

| | | |
|---|---|------------------------|
| TEST Procedure No.: A080510.030\$\$ | Date Executed: | Test Conductor: |
| Title: | RMA Assurance Test and Analysis | |
| Objective: | This test case verifies the capability of the SMC ECS to provide services with required reliability, maintainability and availability (RMA). It confirms the capability of the SMC ECS to correct faults and to restore system capabilities within specified times. GSFC 420-05-03, Performance Assurance Requirements for the EOSDIS is the primary RMA Program Plan and , MIL-HDBK-217F, Reliability Prediction of Electronic Equipment, and MIL-HDBK-472, Maintainability Prediction, Procedure IV, provide guidelines in verifying ECS RMA. Table 8-1 summarizes key availability and maximum Mean Down Time (MDT) requirements for specific ECS services verified by this test case. | |
| Requirements | Acceptance Criteria | |
| EOSD3490#A | This requirement is verified through inspection. (RTM: Demo) Reliability statistics for ECS shall be collected and monitored using the Mean Time Between Maintenance (MTBM) for each component and operational capability. This capability is demonstrated by inspection of the MTBM Predictions used in, and analysis results documented in the DID #515. The inspection of process and procedures to collect and analyze RMA data during system operations after RRR will verify that Mean Time Between Maintenance MTBM will be collected and monitored. | |

| | |
|------------|--|
| EOSD3492#A | <p>This requirement is verified through inspection.</p> <p>RMA data shall be maintained in a repository accessible for logistics analysis and other purposes.</p> <p>This capability is demonstrated by inspection of the RMA database documented in the approved DIDs #516 and #518.</p> |
| EOSD3500#A | <p>This requirement is verified through inspection.</p> <p>The ECS RMA Program shall adhere to GSFC 420-05-03, Performance Assurance Requirements for the EOSDIS.</p> <p>This capability is demonstrated by inspection of RMA Program Plan which is Section 7.0 of the approved Performance Assurance Implementation Plan DID #501 .</p> |
| EOSD3510#A | <p>This requirement is verified through inspection.</p> <p>Reliability predictions shall be calculated in accordance with the parts count analysis method, Appendix A, of MIL-HDBK-217F, Reliability Prediction of Electronic Equipment.</p> <p>This capability is demonstrated by inspection of the prediction process and Reliability prediction values in the approved DID #516.</p> |
| EOSD3600#A | <p>This requirement is verified through inspection.</p> <p>Maintainability shall be predicted in accordance with MIL-HDBK-472, Maintainability Prediction, Procedure IV.</p> <p>This capability is demonstrated by inspection of the prediction process and Maintainability prediction values in the approved DID #518.</p> |
| EOSD3620#A | <p>This requirement is verified through inspection. (RTM: analysis)</p> <p>ECS shall predict and periodically assess maintainability by measuring the actual MDT and comparing to the required MDT.</p> <p>The prediction requirement is demonstrated by inspection of the process and prediction values in the approved DID #515 and #518. The assessment requirement of the actual MDT is demonstrated by inspection of the process and procedures to collect and analyze RMA data during system operations after RRR .</p> |
| EOSD3625#A | <p>This requirement is verified through inspection.</p> <p>For ECS functions with a backup capability, ECS shall use switchover time to the backup capability in measuring maintainability, rather than down time, when the component goes down.</p> <p>This requirement is demonstrated by inspection of the approved DID #515.</p> |
| EOSD3630#A | <p>This requirement is verified through inspection. (RTM: analysis)</p> <p>The maximum down time shall not exceed twice the required MDT in 99 percent of failure occurrences.</p> <p>This requirement will be demonstrated by inspection of the actual MDT data when the system has been in operation for a statistically significant length of time. (Note: This requirement is not verifiable until the system has been in operation for a statistically significant length of time.)</p> <p>This requirement is not verifiable until the system has been in operation for a statistically significant length of time.</p> |

| | | | | |
|---|--|-----------|-------------|---------|
| EOSD4030#A | <p>This requirement is verified through inspection.</p> <p>The SMC function of gathering and disseminating system management information shall have an operational availability of .998 at a minimum (.999998 design goal) and an MDT of 20 minutes or less (5 minutes design goal), for critical services.</p> <p>This operational availability requirement is demonstrated by inspection of the approved DID #515. This MDT requirement is demonstrated by the Maintainability Demo Test defined in DIDs #511 and #512 and documented in the Report DID 519.</p> | | | |
| EOSD4036#A | <p>This requirement is verified through inspection. (RTM: analysis)</p> <p>The operational availability of individual ESN segments shall be consistent with the specified operational availability of the supported ECS functions.</p> <p>On ESDIS List.</p> | | | |
| EOSD4100#A | <p>This requirement is verified through test.</p> <p>The ECS segments, elements, and components shall include the on-line (operational mode) and off-line (test mode) fault detection and isolation capabilities required to achieve the specified operational availability requirements.</p> <p>This requirement is demonstrated by the Maintainability Demonstration Test defined in DIDs #511 and #512 and documented in the Report DID 519..</p> | | | |
| <p>Test Inputs: Test case inputs include reliability data and repair specifications for key ECS components, in-the-field maintenance records, and demonstrations by operations staff of repair procedures for various failure occurrences.</p> | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |

| Step-By-Step Procedures | | |
|-------------------------|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Resource Controller: Inspects DID #515 to verify the following requirements: EOSD3490#A, EOSD3620#A, EOSD3625#A, EOSD4030#A. | |
| 20 | Expected Result: The expected result for each requirement is as stated in the acceptance criteria for each respective requirement. | |
| 30 | SMC Resource Controller: Inspects DID #516 for the following requirements: EOSD3492#A, EOSD3510#A. | |
| 40 | Expected Result: The expected result for each requirement is as stated in the acceptance criteria for each respective requirement. | |
| 50 | SMC Resource Controller: Inspects DID #518 for the following requirements: EOSD3492#A, EOSD3600#A, EOSD3620#A. | |
| 60 | Expected Result: The expected result for each requirement is as stated in the acceptance criteria for each respective requirement. | |
| 70 | SMC Resource Controller: Inspects DID #501 for the following requirements: EOSD3500#A. | |
| 80 | Expected Result: The expected result for each requirement is as stated in the acceptance criteria for each respective requirement. | |
| 110 | SMC Resource Controller: Examines the test executed in Maintainability Demo Test, DID #511 and DID #512 to verify that the SMC function of gathering and disseminating system management information has a maximum Mean Down Time (MDT) of 20 minutes or less (EOSD4030#A). | |
| 120 | Expected Result: DID #519 (Test Report) states that the result of the test stated in DID #511 and DID #512 indicating the SMC function of gathering and disseminating system management information has a maximum Mean Down Time (MDT) of 20 minutes or less. | |
| 130 | SMC Resource Controller: Examines the test executed in Maintainability Demo Test, DID #511 and DID #512 to verify that the ECS system includes the on-line (operational mode) and off-line (test mode) fault detection and isolation capabilities required to achieve the specified operational availability (EOSD4100#A). | |
| 140 | Expected Result: DID #519 (Test Report) states that the expected result of the test stated in DID #511 and DID #512 indicating the ECS system includes the on-line (operational mode) and off-line (test mode) fault detection and isolation capabilities required to achieve the specified operational availability. | |

Data Reduction and Analysis Steps:

Expected results include inspecting the related Maintainability Demo Test documents to confirm that the ECS can make needed services available as required and can repair from failed capabilities.

Signature:**Date:****8.5.2 Performance Monitoring, Analysis & Testing Sequence**

This test sequence guides the reviewer in inspecting system and site capabilities for performing, analyzing and reporting on short and long term performance trend analyses of system and site operational status, specific resource performance and maintenance activities. The SMC's performance management team procedures monitoring system site hardware and software to determine their operational states (on-line, failed, in maintenance mode, test mode, or simulation mode) are inspected.

This sequence also guides the reviewer in confirming SMC and each LSM's capability to generate, as needed, requests for performance testing including resources to be tested, test purpose, requested test environment, impacts to operations and expected results. This evaluation includes confirmation and review of the SMC performance test tool and evaluation of SMC and LSM personnel resources to determine the ability of the system and site test teams to respond to specific testing requests.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interface(s): The external interfaces (i.e. other ECS sites and data sources) needed for a sequence (real and simulated external systems) are listed:

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) need to support a sequence are listed:

DAAC Resource Planner

SMC Performance Analyst

SMC Resource Controller

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (DID 605/OP2), that were used to develop tests in this sequence of tests are listed:

Resource Planning (Section 3.7.1) - A080520.010\$\$

User Notes Performance Degradation (Section 3.5.2) - A080530.010\$\$

Performance Trending Scenario (Section 3.5.4) - A080530.010\$\$

Preparing for New Algorithm Scenario (Section 3.5.3) - A080530.010\$\$

Test Dependencies: The following table identifies the test procedures in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--|------------|
| A080520.010\$\$ | Software Development Benchmark Test | Prior |
| A080530.010\$\$ | A080520.010\$\$ | Concurrent |

8.5.2.1 Performance Testing

| | | |
|---|--|------------------------|
| TEST Procedure No.: A080520.010\$\$ | Date Executed: | Test Conductor: |
| Title: Performance Testing | | |
| Objective: This test case verifies that the SMC have the capability to generate and coordinate requests for performance and benchmark testing. It also evaluates the SMC's ability to respond to testing requests. | | |
| Requirements | Acceptance Criteria | |
| EOSD0560#A | This requirement is verified through demonstration. ECS benchmark tests and test data sets shall be defined for system verification and data quality evaluation. The benchmark tests and test data sets provided by a representative ECS element (e.g., a SMC subsystem) will run to completion and generate reports. | |
| EOSD0700#A | This requirement is verified through demonstration. Each ECS element shall provide the following, to be used in the revalidation of its functional performance: a. Benchmark test(s) b. Standard test data sets. A representative ECS element's (e.g., a SMC subsystem) benchmark tests used to revalidate its functional performance(e.g., response time) will be run to completion successfully. | |
| EOSD0720#A | This requirement is verified through demonstration. Each ECS element shall be able to validate at any time during the life-time of the ECS that the ECS element primary functional performance is consistent with pre-defined operational benchmark tests. A representative ECS element's (e.g., a SMC subsystem) benchmark tests will be run to completion successfully. | |

| | | | | |
|--|--|------------------|--------------------|----------------|
| SMC-3400#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall generate, as needed, requests for performance testing that includes, at a minimum:</p> <ul style="list-style-type: none">a. Resource to be testedb. Test purposec. Requested test priorityd. Required test environmente. Impacts to operationsf. Expected test results <p>Performance tools will be used by an operations staff to request performance testing which includes the following information:</p> <ul style="list-style-type: none">a. Resource to be testedb. Test purposec. Requested test priorityd. Required test environmente. Impacts to operationsf. Expected test results | | | |
| Test Inputs: Test case inputs include benchmark tests and standard test data sets for a representative SMC ECS element (e.g., MSS Subsystem) provided by the software development group. Scripts or M&O procedures to cause performance testing requests to be generated will also be needed. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Resource Controller: Follows M&O's to be developed procedure for requesting performance test (in this case, benchmark test). | |
| 20 | Expected Result: Performance test request procedure executed. | |
| 30 | SMC Resource Controller: Starts Resource Planning tool. | |
| 40 | Expected Result: Resource Planning window appears on the screen. | |
| 50 | SMC Resource Controller: Clicks Edit push-button on the Resource Planning window. | |
| 60 | Expected Result: Resource Request form appears in the window. | |
| 70 | SMC Resource Controller: Enters a request to run a benchmark test on SMC host, including start and end times, resources, brief description including test purpose and priority, comments including required environment, impacts to operations, and expected test results. Then clicks 'Accept. | |
| 80 | Expected Result: The request is entered into the resource planning database. | |
| 90 | SMC Resource Controller: Clicks Review push-button on the Resource Planning window. | |
| 100 | Expected Result: A list of resource requests appears on the screen. | |
| 110 | SMC Resource Controller: Double clicks on the request. | |
| 120 | Expected Result: The complete request as previously entered by the tester appears on the screen. | |
| 130 | SMC Resource Controller: Inspects the request for validity. Clicks on the Validate and Approve push-buttons on the screen. | |
| 140 | Expected Result: The resource request includes the 'Validated' and 'Approved' indicators. | |
| 150 | SMC Resource Controller: Clicks on the Accept push-button. | |
| 160 | Expected Result: The resource planning database is successfully updated. | |
| 170 | SMC Resource Controller: Initiates the SMC performance benchmark test. | |
| 180 | Expected Result: The SMC performance benchmark test runs to completion, storing a summary of results in the performance database and printing a summary of the results. | |

Data Reduction and Analysis Steps:

The printed benchmark summaries are examined to ensure that they are consistent with the observations of the AT team during the actual test runs.

The history log (or performance management database) is analyzed and the performance benchmark test request should include:

- a. Resource to be tested
- b. Test purpose
- c. Requested test priority
- d. Required test environment
- e. Impacts to operations
- f. Expected test results

Signature:**Date:**

8.5.2.2 Performance Monitoring and Analysis

| TEST Procedure No.: A080530.010\$\$ | Date Executed: | Test Conductor: |
|--|--|------------------------|
| Title: Performance Monitoring and Analysis | | |
| Objective: This test case verifies the capabilities of the SMC to use performance management tools to augment overall system management activities for all ECS resources and personnel. The test objectives are to observe and acquire performance trend information.. Visualization capabilities that enable SMC operations personnel to determine the state for each principal node of the ECS network and the LAN, respectively, are confirmed. | | |
| Requirements | Acceptance Criteria | |
| ESN-1060#A | This requirement is verified through test. The ESN performance management function shall provide the capability to evaluate the performance of ESN resources and interconnection activities. On ESDIS List. | |
| ESN-1065#A | This requirement is verified through analysis. The ESN performance management function shall include trend analysis for prediction of loading and bottlenecks/delays. On ESDIS List. | |
| NI-0460#A | This requirement is verified through test. ECS shall have the capability to receive periodic information regarding EBnet network performance and link utilization. The EBnet network performance and link utilization will be sent to ECS periodically and will be monitored by querying the management database and included in a performance report. | |
| SMC-3300#A | This requirement is verified through demonstration. The SMC shall monitor site and element hardware status to determine their operational states including, at a minimum: a. On-line b. Failed c. In maintenance d. In test mode e. In simulation mode The operational states (i.e., on-line, failed, in maintenance, in test mode and in simulation mode) of ECS site and hardware will be indicated via the HP Open View. | |
| SMC-3320#A | This requirement is verified through demonstration. The SMC shall monitor execution of ground operations events. The performance data resulting from one of the ground operation events (i.e., performance testing: A080520.010\$\$, SMC-3400#A) will be collected and analyzed. | |
| SMC-3330#A | This requirement is verified through test. (RTM: demonstration.) The SMC shall compare and evaluate system-wide, site, and element actual schedule performance against planned schedule performance. A set of tasks will be executed and reports generated by SMC for the actual schedule performances related to system/site/element will be manually compared against those of planned schedule performances. | |

| | | | | |
|--|--|-----------|-------------|---------|
| SMC-3410#A | <p>This requirement is verified through test. (RTM: analysis.)</p> <p>The SMC shall perform short and long-term trend analysis of system, site, and element performance to include, at a minimum:</p> <ul style="list-style-type: none">a. Operational statusb. Performance of a particular resourcec. Maintenance activities (e.g., number of repairs per item) <p>Graphical Performance trend analysis reports on operational status, performance of particular resources and maintenance activities for selected system/sites/elements will be obtained and analyzed.</p> | | | |
| SMC-3420#A | <p>This requirement is verified through analysis.</p> <p>The SMC shall perform short and long term trend analysis of system, site, and element performance to determine the impact on resources of, at a minimum:</p> <ul style="list-style-type: none">a. Modifying system, site, or element activity allocationsb. Potential enhancements to system, site, or element <p>Modification on system, site, and element activity allocations and enhancements to system, site, and element will be performed based on the trend analysis of system/site/element.</p> | | | |
| SMC-3421#A | <p>This requirement is verified through inspection.</p> <p>The SMC shall analyze user feedback information supporting the development of recommended remedial or enhancement actions.</p> <p>M&O 611/OP3 document and on-line software tool (Planning Workbench) will be inspected to ensure that the user feedback information supporting the development of recommended remedial or enhancement actions is stated.</p> | | | |
| <p>Test Inputs: Test case inputs will include planned schedule performance information and various modifications to system, site and element activities. A script that performs a query of the management database will also be needed.</p> | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |

| Step-By-Step Procedures | | |
|--------------------------------|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Resource Controller: Initializes HP OpenView. | |
| 20 | Expected Result: The HP OpenView window appears displaying the root map for the system. | |
| 30 | DAAC Resource Planner: Follows procedure to place computer running System Management Subsystem (MSS) at GSFC DAAC in maintenance mode. | |
| 40 | Expected Result: The System Management Subsystem (MSS) host at GSFC DAAC is now in maintenance mode. | |
| 50 | SMC Resource Controller: Uses the “Locate” function on the HP OpenView menu to bring up the map containing the System Management Subsystem (MSS) host at GSFC DAAC. | |
| 60 | Expected Result: The map containing the System Management Subsystem (MSS) host at GSFC DAAC appears on the screen. The host icon indicates that the host is in maintenance mode. | |
| 70 | DAAC Resource Planner: Follows procedure to place computer running System Management Subsystem (MSS) host at GSFC DAAC in test mode. | |
| 80 | Expected Result: The System Management Subsystem (MSS) host at GSFC DAAC is now in test mode. | |
| 90 | SMC Resource Controller: Uses the “Locate” function on the HP OpenView menu to bring up the map containing the System Management Subsystem (MSS) host at GSFC DAAC. | |
| 100 | Expected Result: The map containing the System Management Subsystem (MSS) host at GSFC DAAC appears on the screen. The host icon indicates that the host is in test mode. | |
| 110 | DAAC Resource Planner: Follows procedure to place computer running System Management Subsystem (MSS) host at GSFC DAAC in simulation mode. | |
| 120 | Expected Result: The System Management Subsystem (MSS) host at GSFC DAAC is now in simulation mode. | |
| 130 | SMC Resource Controller: Uses the “Locate” function on the HP OpenView menu to bring up the map containing the System Management Subsystem (MSS) host at GSFC DAAC. | |
| 140 | Expected Result: The map containing the System Management Subsystem (MSS) host at GSFC DAAC appears on the screen. The host icon indicates that the host is in simulation mode. | |
| 150 | DAAC Resource Planner: Places the host running the System Management Subsystem (MSS) at GSFC DAAC online. | |
| 160 | Expected Result: The host icon is green indicating that the host is up and functioning. | |

| | | |
|-----|--|--|
| 170 | SMC Resource Controller: Induces a failure in a tape drive. (Possibly, attempt to write to a write protected tape cartridge.) | |
| 180 | Expected Result: Failure status for the tape drive appears. | |
| 190 | SMC Resource Controller: Clicks on the icon for the host to which the tape drive is connected. | |
| 200 | Expected Result: The icon is highlighted. | |
| 210 | SMC Resource Controller: Requests to view status of host hardware. | |
| 220 | Expected Result: The status display indicates failure status for the tape drive. | |
| 230 | SMC Resource Controller: Run a script that performs a query of the management database for status and performance information on storage systems, network utilization, ground operation events (e.g., performance testing) etc. The script will create a report from the data. | |
| 240 | Expected Result: A report containing the desired status and performance information is printed. It is saved for post test analysis. | |
| 250 | SMC Resource Controller: Starts up the spreadsheet application. | |
| 260 | Expected Result: The spreadsheet is up and running. | |
| 270 | SMC Resource Controller: Imports the monthly network performance data into the spreadsheet. | |
| 280 | Expected Result: The network performance data from the management database appear in the spreadsheet cells. | |
| 290 | SMC Resource Controller: Creates spreadsheet tables (using the spreadsheet package) containing the network performance data. | |
| 300 | Result: The spreadsheet tables containing the network performance data are created. | |
| 310 | SMC Resource Controller: Enters spreadsheet command to create weekly trend predictions for the next six months for the network performance values using statistical trending functions provided in the spreadsheet application. | |
| 320 | Expected Result: The spreadsheet application calculates future values for the performance metrics using statistical trending functions provided as part of the spreadsheet package. | |
| 330 | SMC Resource Controller: Enters spreadsheet commands to create graphical representations of the trend predictions created in the previous step . | |
| 340 | Expected Result: The spreadsheet application creates a line graph depicting both the actual data stored in the management database and the future values predicted by the spreadsheet for each of the network performance metrics. | |
| 350 | SMC Resource Controller: Change the time interval to be used in trend analysis to get the short term trend analysis. | |
| 360 | Expected Result: The graphs will be automatically updated to reflect the change in data. | |
| 370 | SMC Resource Controller: Selects a host participating in the performance test (A080520.010\$\$ - running concurrently) and clicks on the CPU LOAD option from HP OpenView. | |

| | | |
|--|---|--------------|
| 380 | Expected Result: HP OpenView displays a CPU LOAD graph for execution of the performance test on that host. | |
| 390 | SMC Resource Controller: Clicks on the Memory Utilization for the same test. | |
| 400 | Expected Result: HP OpenView displays a Memory Utilization graph for execution of the performance test on that host. | |
| 410 | SMC Resource Controller: At the conclusion of the performance test (A080520.010\$\$ - running concurrently) enter HP OpenView command to view actual schedule performance data from the test. | |
| 420 | Expected Result: The actual schedule performance data are displayed on the screen. | |
| 430 | SMC Resource Controller: Retrieves planned schedult performance data entered with the test resource request (step 70, A080520.010\$\$). | |
| 440 | Expected Result: The planned schedult performance data are displayed on the screen. | |
| 450 | SMC Resource Controller: Enters command to print a summary report of actual and planned schedule performance data. | |
| 460 | Expected Result: The summary report is printed. The expected results are used for post test analysis. | |
| Data Reduction and Analysis Steps: Spreadsheet tables containing the network performance data are printed and compared with the report generated by querying the management database. The site history log is printed and is examined to verify that the status changes and failures that occur during this test are recorded. | | |
| Signature: | | Date: |

8.6 Ancillary Services Scenario

This scenario takes site management personnel through a series of cases involving the use of system services in the management of the site. It carries the site management staff through certain system fault detection and isolation instances, security monitoring episodes, and accounting and report generation sequences. AT of fault management activity evaluates the capability for performing site-level fault analysis, fault diagnostic testing and recovery actions. Evaluation of ECS accounting and accountability activities extends to LSM in-site functions including related data collection, analysis and reporting activities is assessed. Evaluation of ECS report generation capabilities extends to evaluating the capability for providing required reports specified by all of the services referenced in the system management scenario group.

8.6.1 Fault Management Sequence

This sequence conducts the evaluator through demonstrations of the ECS capability to detect system-level faults and to analyze fault conditions, perform diagnostic testing, and correct from faults (or execute suitable contingency actions). The site operations teams confirm the SMC's capability to handle global faults such as communications failures or catastrophic security violations as well as local SMC fault conditions. The SMC's test tools for isolating, locating, identifying and analyzing faults at the system level (except for flight operations faults) are

confirmed. The SMC's capability for recovering from fault situations is evaluated during previous shutdown and recovery demonstrations in 8.1.4 Site Shutdown/Recovery Sequence.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The following external interfaces needed for this sequence are listed below.

EOC

GSFC, LaRC and EDC DAACs

Operator Positions: The following operator positions are needed to support this sequence.

SMC Network Analyst

Operational Scenario: The following scenarios, taken from the ECS Operations Concept, for the ECS Project, Part 2A document, are used during this sequence of tests.

Trouble Ticket and Problem Tracking Scenario (Section 3.2.1)

Non Conformance Report Scenario (Section 3.14.5)

Test Dependencies: There are no test dependencies required.

8.6.1.1 DADS Fault Analysis and Diagnostics Testing

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.6.1.2 Product Generation Fault Analysis and Diagnostics Testing

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.6.1.3 Communications Fault Analysis and Diagnostics Testing

| TEST Procedure No.: A080610.050\$G | Date Executed: | Test Conductor: |
|---|--|------------------------|
| Title: Communications Fault Analysis and Diagnostic Testing | | |
| Objective: This test verifies the fault management requirements for the communications subsystem of the ECS. Simulated faults are induced in the subsystem to verify fault detection, fault isolation and reporting. | | |
| Requirements | Acceptance Criteria | |
| ESN-0650#A | <p>This requirement is verified through test.</p> <p>The ESN shall perform the following network management functions for each protocol stack implemented in any ECS element, and each communications facility:</p> <ul style="list-style-type: none"> a. Network Configuration Management b. Network Fault Management c. Network Performance Management d. Network Security Management <p>A CSS fault induced by interrupting a network connection must be properly managed such that the fault is detected, system operators are notified about the fault, and the fault is logged and forwarded to the SMC. This test does not include ESN-0650#A items a, c and d.</p> | |
| ESN-0740#A | <p>This requirement is verified through test.</p> <p>The ESN network management service shall retrieve performance/fault data about ESN protocol stacks and equipment.</p> <p>A CSS fault induced by interrupting a network connection must be detected and information provided that accurately identifies the fault. Performance data is not tested in this test case.</p> | |
| ESN-0810#A | <p>This requirement is verified through test.</p> <p>ESN shall provide the following fault management functions at a minimum:</p> <ul style="list-style-type: none"> a. detect the occurrence of faults, b. control the collection of fault information, and c. diagnose the probable cause of a detected fault <p>A CSS fault induced by interrupting a network connection must be detected, accurately diagnosed, and logged.</p> | |
| ESN-0815#A | <p>This requirement is verified through test.</p> <p>Network simulation and traffic modeling capability shall be provided to troubleshoot network problems and to use in network planning.</p> <p>The Tester uses network simulation to solve the network fault.</p> <p>Change method from analysis to test in a CCR.</p> | |
| ESN-0830#A | <p>This requirement is verified through test.</p> <p>The ESN shall have the capability to detect and report communications related errors and events both locally and at the ESN network management facility.</p> <p>An ISS fault induced by interrupting a network connection must be detected, accurately diagnosed, logged and reported locally and at the SMC.</p> | |

| | |
|------------|--|
| ESN-0840#A | <p>This requirement is verified through test.</p> <p>The ESN shall have error reporting, event logging and generation of alerts. A CSS fault induced by interrupting a network connection must be reported and logged in the event log file and alerts generated.</p> |
| ESN-0900#A | <p>This requirement is verified through test.</p> <p>Errors and events to be detected shall include at least:</p> <ul style="list-style-type: none"> a. communications software version or configuration errors b. communications hardware errors c. protocol errors d. performance degradation conditions e. telecommunications errors and failures <p>CSS faults induced by interrupting a telecommunication connection, network connection, or configuration error must be reported and logged in the event log file and alerts generated. This test does not test item d of the requirement</p> |
| ESN-0910#A | <p>This requirement is verified through test.</p> <p>The ESN fault management shall provide the capability to perform the following functions, at a minimum, both locally and at the ESN network management facility:</p> <ul style="list-style-type: none"> a. set, view, and change alert threshold values b. enable and disable alert notifications (alarms) within a system c. enable and disable event reports within a system d. manage error and event logging files <p>The MSS Monitor/Control Service will be used to set fault thresholds, enable/disable alarms and reports caused by CSS faults and schedule the transfer of fault management data to the SMC.</p> |
| ESN-0920#A | <p>This requirement is verified through inspection.</p> <p>The ESN shall provide a set of utilities to perform diagnostic and testing functions for purposes of fault isolation.</p> <p>The MSS Fault Management Application Service will provide utilities to perform diagnostics and testing of connectivity between ECS hosts and router, the ability to reach hosts and routers, and the availability of network services at hosts.</p> |
| ESN-1000#A | <p>This requirement is verified through demonstration.</p> <p>The ESN network management function shall have the capability to build histories for different types of errors and events, and the capability to analyze errors and recommend corrective action wherever practical.</p> <p>The MSS Fault Management Application Service will demonstrate the ability to build histories for different types of errors and events detected, for the purpose of analysis.</p> |
| ESN-1010#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide, for selective use as a debugging aid, the capability to perform packet tracing of its supported protocols.</p> <p>This requirement is verified during Integration and Test and is not verified during this test.</p> |
| NSI-0030#A | <p>This requirement is verified through test.</p> <p>NSI shall have the capability of sending and ECS shall have the capability of receiving notification of faults in NSI's network that may affect the quality of NSI services between ECS and its users.</p> <p>The Tester will send a fault notification message across the NSI.</p> |

| | |
|------------|---|
| NSI-0040#A | <p>This requirement is verified through test.</p> <p>NSI shall make available to ECS information regarding fault status and estimated time to repair or resolve NSI faults that may affect the quality of NSI services between ECS and its users.</p> <p>The MSS will receive notification of NSI faults.</p> |
| NSI-0050#A | <p>This requirement is verified through test.</p> <p>NSI shall provide ECS with periodic summary information about faults that may have affected the quality of NSI services between ECS and its users.</p> <p>The MSS will receive periodic summary information about NSI faults.</p> |
| SMC-0340#A | <p>This requirement is verified through test.</p> <p>The SMC shall have the capability of responding to system faults within a maximum of five minutes.</p> <p>The SMC fault management service must send notification of a fault within five minutes of its detection.</p> |
| SMC-4310#A | <p>This requirement is verified through analysis.</p> <p>The SMC shall perform fault analysis including, at a minimum:</p> <ul style="list-style-type: none"> a. Isolation b. Location c. Identification d. Characterization <p>The MSS must be able to diagnose the system faults of all ECS elements.</p> |
| SMC-4311#A | <p>This requirement is verified by demonstration.</p> <p>The SMC shall have the capability to perform fault analysis to the level of, at a minimum:</p> <ul style="list-style-type: none"> a. Subsystem b. Equipment <p>The MSS must be able to diagnose the system faults of all ECS elements.</p> |
| SMC-4320#A | <p>This requirement is verified by demonstration.</p> <p>SMC shall support fault diagnosis testing to include, at a minimum:</p> <ul style="list-style-type: none"> a. Software and hardware tolerance testing b. Resource-to-resource connectivity testing <p>ECS must provide the tools to diagnose a connectivity fault and perform tolerance testing.</p> |
| SMC-4330#A | <p>This requirement is verified by test.</p> <p>SMC shall have the capability to generate fault recovery commands, directives, and instructions to sites and elements except for faults directly related to flight operations.</p> <p>ECS must provide the tools (e-mail) to generate fault recovery commands, directives, and instructions.</p> |

| Step-By-Step Procedures | | |
|--------------------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| Communications Hardware Fault | | |
| 10 | Network Analyst: Logon the MSS server workstation. | |
| 15 | Expected Results: MSS server workstation is available. | |
| 20 | Network Analyst: Initialize HP OpenView using the <ovw &> command. | |
| 30 | Expected Results: A map depicting the overall topology is displayed. | |
| 40 | Network Analyst: Double click on the GSFC icon. | |
| 50 | Expected Results: A map depicting the GSFC DAAC configuration is accurately displayed with all symbols displayed in green. | |
| 60 | Network Analyst: Prepare to send an EMAIL message of considerable length (20 pages or more) to another DAAC. | |
| 70 | Tester: Instruct the Computer Operator to send the EMAIL message, wait approximately 2 seconds then remove power from the FDDI concentrator. | |
| 80 | Expected Results: a. The FDD Concentrator symbol is red b. Audible alarm sounds c. The fault is logged in the error log file d. The fault is forwarded to the SMC | |
| 90 | Network Analyst: Double click on the red FDDI concentrator symbol. | |
| 100 | Expected Results: Information accurately describing the fault is displayed. | |
| 110 | Network Analyst: Close the window for the FDDI concentrator | |
| 120 | Tester: Restore power to the FDDI concentrator. | |
| 130 | Expected Results: The FDDI concentrator symbol is green. | |
| 140 | Network Analyst: Verify the fault is accurately logged and described in the error log file. | |
| Network Communications Fault | | |
| 150 | Tester: Disconnect the LAN cable from the ingest server. | |
| 160 | Expected Results: a. The ingest server symbol is red b. Audible alarm sounds c. The fault is logged in the error log file d. The fault is forwarded to the SMC | |
| 170 | Network Analyst: Double click on the red ingest server symbol. | |

| | | |
|--|---|--|
| 180 | Expected Results: Information accurately describing the fault is displayed. | |
| 190 | Network Analyst: Close the window for the ingest server. | |
| 200 | Tester: Restore the ingest server LAN connection. | |
| 210 | Expected Results: The ingest server symbol is green. | |
| 220 | Network Analyst: Verify the fault is accurately logged and described in the error log file. | |
| Communication Configuration Fault | | |
| 230 | Tester: Change the IP address of one data management server. | |
| 240 | Expected Results: a. The data management server symbol is red b. Audible alarm sounds c. The fault is logged in the error log file d. The fault is forwarded to the SMC | |
| 250 | Network Analyst: Double click on the red data management server symbol. | |
| 260 | Expected Results: Information accurately describing the fault is displayed. | |
| 270 | Network Analyst: Close the window for the data management server. | |
| 280 | Tester: Restore the data management server IP address. | |
| 290 | Expected Results: The data management server symbol is green. | |
| 300 | Network Analyst: Verify the fault is accurately logged and described in the error log file. | |
| Histories | | |
| 310 | Network Analyst: Initiate the MSS Fault Management Application Service. | |
| 320 | Expected Result: The MSS Fault Management Application Service appears on the screen. | |
| 330 | Network Analyst: Using the MSS Fault Management Application Service, build a history for all communications faults for today's date. | |
| 340 | Expected Results: The MSS Fault Management Application Service displays a history of all communications faults produced by this test. | |
| Fault Management | | |
| 350 | Network Analyst: Initiate the MSS Monitor/Control Service. | |
| 360 | Expected Result: The MSS Monitor/Control Service application appears on the screen. | |
| 370 | Network Analyst: Change threshold values managed resources. | |
| 380 | Expected Result: The MSS Monitor/Control Service accepts valid threshold value changes. | |

| | | |
|---|---|--------------|
| 390 | Network Analyst: Change the enable/disable alert status of managed resources. | |
| 400 | Expected Result: The MSS Monitor/Control Service accepts changes to the enable/disable alert status of managed resources. | |
| 410 | Network Analyst: Exit the MSS Monitor/Control Service. | |
| 420 | Network Analyst: Initiate the MSS Fault Management Application Service. | |
| 430 | Expected Result: The MSS Fault Management Application Service appears on the screen. | |
| 440 | Network Analyst: Configure the application to display all fault categories. | |
| 450 | Expected Result: A list of all managed resources is displayed. | |
| 460 | Network Analyst: Change the enable/disable fault notification status of at least two managed resources. | |
| 470 | Expected Result: The MSS Fault Management Application Service accepts the changes. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.1.4 Trouble Ticketing

| | | | | |
|--|-----------------------|--|--------------------|----------------|
| TEST Procedure No.: A080610.060\$S | Date Executed: | Test Conductor: | | |
| Title: Trouble Ticketing | | | | |
| Objective: This test verifies the ability to submit a trouble ticket. | | | | |
| Requirements | | Acceptance Criteria | | |
| SMC-8860#A | | This requirement is verified through test. The SMC shall have the capability to generate detailed and summary fault management reports describing the fault management of ground resources, including, at a minimum: a. Fault type and description b. Time of occurrence of fault c. Effect on system d. Status of fault resolution e. Fault statistics The Trouble Ticketing Service must have a graphical user interface to support the entry and editing of trouble tickets. | | |
| Test Inputs: | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |

| Step-By-Step Procedures | | |
|-------------------------|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | DAAC User Services Representative: Upon realization that a problem exists, selects the Trouble Ticket icon from the ECS Desktop. | |
| 20 | Expected Results: ECS Desktop invokes user-preferred browser with Trouble Ticketing home page URL. | |
| 30 | DAAC User Services Representative: Views Trouble Ticketing HTML home page options. | |
| 40 | Expected Results: Options: Submit TT, List TTs are displayed on the screen. | |
| 50 | DAAC User Services Representative: Selects the Submit Option. | |
| 60 | Expected Results: The system calls the Trouble Ticket Submit page. The system automatically retrieves user information from database. (e.g., e-mail address, name, phone number, etc.). | |
| 70 | DAAC User Services Representative: Enters problem impact, problem short description, and problem long description. When satisfied with the entry, clicks on the submit button to submit TT. | |
| 80 | Expected Results: The system creates new entry in Remedy, notifies Operations Supervisor, displays successful submission HTML page (except for internal submissions) which includes the TT number, and notifies User via e-mail which also includes the TT number. | |
| 90 | DAAC User Services Representative: Receives e-mail verifying that the TT was submitted. | |
| 100 | Expected Results: An e-mail message receipt notification pop-up window is displayed on the screen. The system notifies the Operations Supervisor of the new Trouble Ticket. | |
| 110 | Operations Supervisor: Refreshes TT list to check for most recent TTs. | |
| 120 | Expected Results: The system (Remedy) refreshes list. | |
| 130 | Operations Supervisor: Selects TT for work and opens it. | |
| 140 | Expected Results: The system (Remedy) opens TT. | |
| 150 | Operations Supervisor: On examining the detailed information, changes the value of Ticket Status from New to Assigned. | |
| 160 | Expected Results: The system displays the Options: Assigned, Forwarded. | |
| 170 | Operations Supervisor: Assigns the value of Low to the Assigned-Priority field. | |
| 180 | Expected Results: The system displays the Options: Low, Medium, High) | |
| 190 | Operations Supervisor: Assigns the Trouble Ticket to a particular Computer Operator to fix the problem and clicks on Apply to carry out these new changes. | |

| | | |
|---|---|--------------|
| 200 | Expected Results: The system (Remedy) delivers e-mail to the Computer Operator. | |
| 210 | Computer Operator: Receives e-mail notifying him/her of the assignment. | |
| 220 | Expected Results: An e-mail message receipt notification pop-up window is displayed on the screen. | |
| 230 | Computer Operator: Inputs an initial entry into the Resolution Log (which is a free text diary) indicating the proposed course of action. | |
| 240 | Expected Results: The Resolution Log displays the initial entry. | |
| 250 | Computer Operator: Then clicks on Apply to update the TT with this status. | |
| 260 | Expected Results: The system (Remedy) updates TT. | |
| 270 | Computer Operator: Analyzes and attempts to resolve the issue that the TT addresses, then updates the Resolution Log with pertinent information. Each update to the Resolution Log is followed by a click on the Apply button to commit the update. | |
| 280 | Expected Results: The system (Remedy) updates Resolution Log with time/date, name of modifier and current log. | |
| 290 | Computer Operator: After finding a solution, changes the Ticket Status to Solution Proposed | |
| 300 | Expected Results: The system displays the Options: Solution Proposed. | |
| 310 | TT Review Board: Compiles a package of new "Solution Proposed" TTs for review by the board. Considers the sensibility and long term effects of the proposed solution for this TT. Approves the solution and changes the Status to Implement Solution . | |
| 320 | Expected Results: Options: Forwarded, Closed, Implement Solution are displayed on the screen. | |
| 330 | Computer Operator: Fixes the problem and changes Status to Solution Implemented . | |
| 340 | Expected Results: The problem is corrected and the new status displayed on the screen is Solution Implemented . | |
| 350 | TT Review Board: Approves fix select Key Words , Closing Code , Hardware Resource , and/or Software Resource values as applicable, and upon User Verification Closes TT. | |
| 360 | Expected Results: The trouble ticket is closed. | |
| 370 | Computer Operator: Sends e-mail to the DAAC User Services Representative notifying him/her of the TT being closed. | |
| 380 | Expected Results: An e-mail message receipt notification pop-up window is displayed on the screen. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.1.5 Non Conformance Report

| | | | | | |
|--|--------------------|--|--------------------|------------------------|--|
| TEST Procedure No.: A080610.070SS | | Date Executed: | | Test Conductor: | |
| Title: Non Conformance Report | | | | | |
| Objective: This test verifies the ability of recording and reporting of a software problem. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| SMC-8860#A | | This requirement is verified through test. The SMC shall have the capability to generate detailed and summary fault management reports describing the fault management of ground resources, including, at a minimum: a. Fault type and description b. Time of occurrence of fault c. Effect on system d. Status of fault resolution e. Fault statistics The Trouble Ticketing Service must have a graphical user interface to support the entry and editing of trouble tickets. | | | |
| Test Inputs: | | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version | |
| | | | | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | DAAC User Services Representative: Takes a call (or E-mail) reporting a software defect and clicks on the Trouble Ticketing tool icon on his desktop. | |
| 20 | Expected Results: Trouble Ticketing application starts up. | |
| 30 | DAAC User Services Representative: Fills in items in Trouble Ticket (e.g., application, platform, version, description, user information and E-mail address etc.) based on User's inputs. Rep confirms items with user, and submits ticket. For E-mail correspondence, a message is sent to the user with this information. | |
| 40 | Expected Results: Application submits the ticket to Remedy. | |
| 50 | DAAC User Services Representative: Regularly monitors trouble ticket status and notifies user when problem is resolved. | |
| 60 | Expected Results: Application notifies user when resolution is implemented. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.2 Security Management Sequence

This sequence provides the guidance in verifying the SMC's capabilities for establishing and maintaining security management data bases and for system-wide security activities. This sequence verifies the SMC system-wide abilities related to physical security password management, operational security, data security, privileges, and security compromise mitigation. The presence of system-level services for access control, authentication of user credentials is confirmed. Countermeasures for security threats such as unauthorized modification of data, disclosure of authentication information, denial of authorized service, and impersonation of authentication information, is also confirmed. Authentication, access control, data integrity, and data confidentiality protection functions are confirmed and evaluated against system and site requirements. Event functions (detection, reporting, and logging) are demonstrated and confirmed by comparison with system and site requirements.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The following external interface needed to perform this sequence of tests listed below.

EOC

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Positions: The following operator positions are needed to support this sequence.

SMC Resource Manager

SMC Computer Operator

Operational Scenario: The following scenarios, taken from the ECS Operations Concept for the ECS Project, Part 2A document, are used during this sequence of tests:

Security Management Login Failure Scenario (Section 3.6.1)

Test Dependencies: There are no test dependencies needed for this sequence of tests.

8.6.2.1 SMC Security Functions

| TEST Procedure No.: | Date Executed: | Test Conductor: |
|---|--|-----------------|
| A080620.030\$\$ | | |
| Title: SMC Security Functions | | |
| Objective: The objective of this test is to verify the LSM security functions; such as maintaining, authenticating, and monitoring user and device accesses and privileges; performing security testing that includes, password auditing and site internal access/privileges checking; performing compromise detection (e.g. virus or worm penetration); and performing risk detection and analyses. | | |
| Requirements | Acceptance Criteria | |
| EOSD2400#A | This requirement is verified through test. ECS shall provide multiple categories of data protection based on the sensitivity levels of ECS data, as defined in NHB 2410.9. The system must control access to archived data to prevent unauthorized access. The system must authenticate that the interactive user is authorized. | |
| EOSD2510#A | This requirement is verified through demonstration. ECS elements shall maintain an audit trail of: a. All accesses to the element security controlled data b. Users/processes/elements requesting access to element security controlled data c. Data access/manipulation operations performed on security controlled data d. Date and time of access to security controlled data e. Unsuccessful access attempt to the element security controlled data by unauthorized users/elements/processes f. Detected computer system viruses and worms g. Actions taken to contain or destroy a virus The CSS Security service must provide the capability to log audit information into security logs whenever authentication and authorization services are used. The audit information must contain the following: a. Date and time of the event b. User name c. Type of event d. Success or failure of the event e. Origin of the request. | |

| | |
|------------|---|
| EOSD2550#A | <p>This requirement is verified through test.</p> <p>The ECS elements shall limit use of master passwords or use of a single password for large organizations requiring access to a mix of security controlled and non-sensitive data.</p> <p>The System must require a unique user identification and password for each individual user.</p> |
| EOSD2650#A | <p>This requirement is verified through test.</p> <p>ECS elements shall report detected security violations to the SMC.</p> <p>The LSM must contact the SMC in the event of a security violation via electronic mail or telephone.</p> |
| EOSD2710#A | <p>This requirement is verified through demonstration.</p> <p>ECS elements shall report all detected computer viruses and actions taken to the SMC.</p> <p>The System must provide virus detection services. The LSM must report detected security violations to the SMC.</p> |
| ESN-0010#A | <p>This requirement is verified through test.</p> <p>ESN shall provide the following standard services:</p> <ul style="list-style-type: none"> a. Data Transfer and Management Services b. Electronic Messaging Service c. Remote Terminal Service d. Process to Process Communication Service e. Directory and User Access Control Service f. Network Management Service g. Network Security and Access Control Service h. Internetwork Interface Services i. Bulletin Board Service <p>The Tester must verify the various SMC security functions.</p> <p>This test does NOT verify parts a, b, c, d, e, f, h, and i of the requirement.</p> |
| ESN-0650#A | <p>This requirement is verified through test.</p> <p>The ESN shall perform the following network management functions for each protocol stack implemented in any ECS element, and each communications facility:</p> <ul style="list-style-type: none"> a. Network Configuration Management b. Network Fault Management c. Network Performance Management d. Network Security Management <p>The CSS Security service must provide the capability to create/modify/delete user accounts and privileges in the security registry.</p> <p>The CSS Security service must provide the capability to define/modify/delete group information in the security registry.</p> <p>This test does NOT verify parts a, b and c of the requirement.</p> |
| ESN-1380#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide countermeasures for the following security threats related to data communications:</p> <ul style="list-style-type: none"> a. modification of data (i.e., manipulation) while in transit over the network b. disclosure of authentication information c. degradation in network or processing resource performance through denial of service attack d. Impersonation of authentication credentials or authorization privileges. <p>The CSS Security service must provide an API to check the authorization privileges of principals to access/control services/resources. The CSS Security service must support the Data Encryption Standard (DES) to encrypt and decrypt data.</p> |

| | |
|--|--|
| ESN-1400#A | <p>This requirement is verified through test.</p> <p>The following security functions and services, at a minimum, shall be provided:</p> <ul style="list-style-type: none"> a. authentication b. access (authorization) control c. data integrity d. data confidentiality. <p>The CSS Security service must provide an API to check the authorization privileges of principals to access/control services/resources. The CSS Security service must support the Data Encryption Standard (DES) to encrypt and decrypt data.</p> |
| ESN-1430#A | <p>This requirement is verified through test.</p> <p>The ESN shall provide the following security event functions:</p> <ul style="list-style-type: none"> a. Event detection b. Event reporting c. Event logging. <p>CSS Event Logger Service must provide capability to record security event and history data to an application specific log file.</p> |
| SMC-0350#A | <p>This requirement is verified through test.</p> <p>The SMC shall have the capability of responding to security compromises within a maximum of five minutes.</p> <p>The SMC fault management service must send notification of a fault within five minutes of its detection.</p> |
| SMC-6310#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall perform, as needed, security audit trails.</p> <p>The SMC must have the ability to perform security audit trails within its element.</p> |
| SMC-6220#A | <p>This requirement is verified through demonstration.</p> <p>The SMC shall perform, as needed, data and user audit trails.</p> <p>The SMC must have the ability to perform data and user audit trails within its element.</p> |
| Test Inputs: Authorized/Approved user id and password | |

| Step-By-Step Procedures | | |
|--------------------------------|---|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Resource Manager: Verifies the existence of virus detection software. | |
| 20 | Expected Results: The virus detection software is installed and operational on the system. | |
| 30 | Computer Operator: Executes a security administrator logon. | |
| 40 | Expected Results: The system displays the security administrator main menu. | |
| 50 | Computer Operator: Performs create, change and delete commands to the security registry. | |
| 60 | Expected Results: User accounts are created, changed and deleted. | |
| 70 | Computer Operator: Verifies that the user accounts contain username, password, group and user identification code, login directory and command line interpreter. | |
| 80 | Expected Results: User accounts reflect create, change and delete commands entered by the Computer Operator. | |
| 90 | Computer Operator: Logs off. | |
| 100 | Expected Results: The system displays the logon screen. | |
| 110 | Computer Operator: Executes logon with user id. | |
| 120 | Expected Results: The system displays the main menu. | |
| 130 | Computer Operator: Performs, create, change and delete commands to the security registry. | |
| 140 | Expected Results: The user accounts are created, changed and deleted from the system. | |
| 150 | Computer Operator: Verify that modifications are reflected in the user accounts. | |
| 100 | Expected Results: User accounts reflect create, change and delete commands entered by the Computer Operator. | |
| 110 | Computer Operator: Logs off. | |
| 115 | Expected Results: The ECS login screen is displayed on the screen. | |
| 120 | Computer Operator: Using SATAN and CRACK, attempts to log in by guessing passwords. Repeat multiple times. | |
| 130 | Expected Results: The security management service detects the multiple events after the preestablished threshold has been crossed. The service sends notification of security alert to the Computer Operator. | |
| 140 | Computer Operator: Receives multiple security alerts. Begins investigation into cause of alerts by invoking the events browser (log) to retrieve the security events. | |

| | | |
|---|---|--------------|
| 150 | Expected Results: Displays the requested events. The information must contain the following: a. Date and time of the event b. User name c. Type of event d. Success or failure of the event e. Origin of the request | |
| 160 | Computer Operator: Discovers that the login attempts on the multiple hosts originated from the same area. | |
| 170 | Computer Operator: Contacts the MIS manager at the location of the User (Hacker) who proceeds to have the issue investigated locally. Sends e-mail to all ECS sites informing them of the event and to explicitly deny access from this area. | |
| 180 | Computer Operator: Modifies the network security authorization databases to deny all incoming accesses from the host in question. | |
| 190 | 1st Authorized/Approved User: Logs on to ECS using a valid user id and password. | |
| 200 | Expected Results: The user is able to log onto the system. The next user screen appears. | |
| 210 | Tester: Using a network analyzer, verifies that the password is not readable over the network. | |
| 220 | 2nd Authorized/Approved User: Attempts to log on to ECS using the same valid user id and password used by the 1st Authorized/Approved User in step 190. | |
| 230 | Expected Results: The user is unable to log onto the system. A message indicating the user is already logged on is displayed. | |
| 240 | 1st Authorized/Approved User: Compromises the data by deleting files. | |
| 250 | Expected Result: The system detects the compromise, isolates it, until it can be eliminated. | |
| 260 | Computer Operator: Discovers that the security violation compromise. | |
| 270 | Computer Operator: Using the Office Automation tools provided, generates instructions for recovery from the detected security event. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.2.2 LSM Security Functions

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.6.3 Accounting and Accountability Sequence

This sequence guides the evaluator through and assessment of the ECS and GSFC capability to perform compliant accounting and accountability functions. SMC ability to establish, maintain, and update data

tracking systems to track data transport from ECS input to ECS output, and to allow statusing of all product-production activities is confirmed by inspection of outputs.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The following external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed below.

ECS Client

Operator Positions: The following operator positions are needed to support this sequence.

SMC Accountant

Operational Scenario(s): The operations scenario, taken from the Operations Scenarios for the ECS Project: Release-A document (605/OP1), that was used to develop tests in this sequence of tests are listed:

Network Data Distribution (Pull) Scenario (Nominal) Process (Section 3.11.1)

Accountability Management Create User Account Scenario (Section 3.6.2)

Test Dependencies: There are no test dependencies required.

8.6.3.1 Accountability: Data Tracking and Audit Trails

| TEST Procedure No.: A080630.020S | Date Executed: | Test Conductor: |
|---|--|------------------------|
| Title: Accountability: Data Tracking and Audit Trails | | |
| Objective: This procedure verifies the ECS's ability to manage user accounts, track production activities, and to manage the configuration of system HWCI and CSCI elements. | | |
| Requirements | Acceptance Criteria | |
| SMC-6330#A | This requirement is verified through test The SMC shall establish, maintain, and update a data tracking system that, at a minimum: a. Tracks data transport from system input to system output b. Allows the status of all product-production activities to be determined. The ECS data tracking system must list data transport activities and provide status of all product-production activities. | |
| SMC-6340#A | This requirement is verified through demonstration. The SMC shall track system configuration that, at a minimum, audits: a. Hardware resources b. Software resources. The MSS configuration management application service must identify a particular software element whose version varies from the operational baseline. | |

| Step-By-Step Procedures | | |
|--|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| User Accountability Test | | |
| 10 | SMC Accountant: Login to the MSS server workstation using a valid ID and password as an administrator. | |
| 20 | Expected Results: Access to the MSS Server is available. | |
| 30 | SMC Accountant: Using the MSS Security Management Application Service GUI, create a user account with the following attributes: a. user name b. password c. group identification code d. user identification code e. login directory f. resource access privileges | |
| 40 | Expected Results: The new user account is accepted by the system. | |
| 50 | SMC Accountant: Login as a remote user using the user name and password created in step 30. | |
| 60 | Expected Result: The user is logged onto the ECS and the search and order tool appears on the users screen. | |
| 70 | SMC Accountant: Logoff as a remote user. | |
| 80 | Expected Results: The login screen appears. | |
| 90 | SMC Accountant: Attempt to remote login to the ECS using an invalid password. | |
| 100 | Expected Result: The login attempt is denied. | |
| 110 | SMC Accountant: Attempt to repeat step 90 five times. | |
| 120 | Expected Result: Attempts to login are limited to five tries. | |
| 130 | SMC Accountant: Using the MSS accountability management service MUI, view the activities log associated with the new user. | |
| 140 | Expected Results: The log should show one login for the new user and five unsuccessful attempts to login. | |
| Configuration Accountability Test | | |
| 150 | SMC Accountant: Using the configuration management application service, view the configuration of controlled resources that comprise the site's operational baseline. | |
| 160 | Expected Results: There are no variations from the operational baseline. | |
| 170 | SMC Accountant: Remove a printer from the site configuration. Remove a software application from the site configuration. | |

| | | |
|---|--|--------------|
| 180 | Expected Results: The configuration management application service identifies the variants from the site operational baseline. | |
| 190 | SMC Accountant: Re-install the printer in the site configuration. Re-install the removed software into the site configuration. | |
| 200 | Expected Results: The configuration management application service shows no variations from the site's operational baseline. | |
| 210 | SMC Accountant: Logoff of the system. | |
| 220 | Expected Results: The UNIX prompt appears. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.3.2 Accountability: LSM Data Tracking

This test procedures is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

8.6.4 Report Generation Sequence

This sequence guides the evaluator in assessing ECS capability for performing the SMC report generation required for Release A. This report generator can produce standard or customized outputs for a full range of inputs, such as a functional allocation report giving the current allocation of ground segment functions; summary configuration status reports; summary training reports; hardware configuration, system and scientific software reports; spares and consumables reports; lists of proposed enhancements; detailed and summary reports indicating the overall performance of the ECS Maintainability Status Reports; product generation status reports; ground resources performance reports; user feedback analysis reports; fault management reports; and security compromise reports. The report generators at the SMC are evaluated through inspection of output products and comparison of the products against site reporting requirements.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for this sequence (both real and simulated) are listed :

GSFC ECS DAAC

LaRC ECS DAAC

EDC ECS DAAC

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (DID 607/OP2) needed to support this sequence are listed:

SMC Performance Analyst

Operational Scenario(s): There are no operations scenarios taken from the Operations Scenarios for the ECS Project: Release-A, used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|--|----------|
| A080640.030\$S | A080640.030\$G A080640.030\$L A080640.030\$E | prior |

8.6.4.1 SMC Report Generator

| | | |
|--|---|------------------------|
| TEST Procedure No.: A080640.030\$S | Date Executed: | Test Conductor: |
| Title: SMC Report Generator | | |
| Objective: Demonstrate the existence and the capabilities of a site-specific report generator residing within the site configuration, and the capability to generate pre-defined reports. | | |
| Requirements | Acceptance Criteria | |
| SMC-8305#A | <p>This requirement is verified by the test method.</p> <p>The LSM shall have the same report generator capability as for the SMC, except it shall be limited to generating reports covering only its particular site or its particular element.</p> <p>The Production Monitor-QA tests that the system provides the capability of a site report generator and that input data sets are available for report access.</p> | |
| SMC-8705#A | <p>This requirement is fully complied with, and is verified by the test method.</p> <p>The LSM shall have the capability to generate the same types of reports listed under the SMC report generation service, except that each report covers only its particular site or its particular element.</p> <p>The Tester tests that the system provides the capability and use of a site report generator to produce standard reports.</p> | |
| SMC-8710#A | <p>This requirement is tested at the SMC and is verified by the test method.</p> <p>The SMC shall have the capability to generate summary configuration status reports that includes, at a minimum:</p> <ul style="list-style-type: none"> a. Current status of all hardware, system and scientific software b. Reason why an item is not currently operational. <p>A report is generated with summary information showing the site inventory of hardware, system and scientific software, and spares and consumables.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> | |

| | |
|------------|---|
| SMC-8750#A | <p>This requirement is semi-automated at the SMC for this release, and is verified by the analysis method.</p> <p>The SMC shall have the capability to generate detailed and summary training reports, including, at a minimum:</p> <ol style="list-style-type: none"> Training programs Training course schedules Training course contents Training course locations Training attendees <p>A report is generated that has detailed and summary information on training programs, training course schedules, training course contents, training course locations, and training attendees.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |
| ESN-0760#A | <p>The test verification method is used to test this requirement.</p> <p>The ESN report generation function shall provide, on an interactive and scheduled basis, accounting, network configuration, fault and performance management information.</p> <p>The Tester tests that the system provides the capability to report information concerning accounting, network configuration, and fault and performance management.</p> |
| ESN-0770#A | <p>The test verification method is used to test this requirement.</p> <p>The ESN query capability shall generate ad hoc statistics and reports based on parameters entered.</p> <p>The Tester tests that the system provides the capability and use of a site report generator to produce communication reports based on the entered parameters.</p> |
| ESN-0775#A | <p>The test verification method is used to test this requirement.</p> <p>The ESN management service shall have the capability to redirect its reports to different devices such as console, disk or printer.</p> <p>The Tester displays the steps involved in producing standard or customized reports through use of the site report generator, from user request through output to selected media.</p> |
| SMC-8770#A | <p>This requirement is satisfied at the SMC, and the test verification method is used.</p> <p>The SMC shall have the capability to generate, at a minimum, detailed and summary reports showing the inventory of:</p> <ol style="list-style-type: none"> Hardware, system, and scientific software Spares and consumables <p>A report is generated composed of summary information showing the site inventory of hardware, system and scientific software, and spares and consumables.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |

| | |
|------------|--|
| SMC-8790#A | <p>This requirement is satisfied at the SMC, and the analysis verification method is used.</p> <p>The SMC shall have the capability to generate, as necessary, a list of proposed enhancements with at least these elements:</p> <ul style="list-style-type: none"> a. Proposal name b. Description of enhancement c. Rationale d. Impacts e. Costs f. Milestone schedule <p>A report is generated containing information showing site proposed enhancements with a proposal name, description of enhancement, rationale, impacts, costs, and milestone schedule.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |
| SMC-8800#A | <p>This requirement is performed at the SMC using the office automation tools. The test verification method is employed.</p> <p>The SMC shall have the capability to generate detailed and summary reports indicating the overall performance of the ECS. At a minimum, they include:</p> <ul style="list-style-type: none"> a. Scheduled versus actual data collection, processing, retrieval, and delivery of routine data b. Scheduled versus actual data collection, processing, retrieval, and delivery of user requested data c. Reason(s) for failure to meet schedules d. Quality of the data e. Ground operations event execution f. Number of interactive user requests and timeliness of response g. User feedback <p>The SMC must have the capability to produce standard or customized reports through use of the site report generator, from user requests through output to selected media.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |
| SMC-8820#A | <p>This requirement is partially complied with at the SMC for this release, and is verified by the test method.</p> <p>The SMC shall have the capability to generate detailed and summary reports indicating the product generation status made in processing, reprocessing, and storage of all standard products.</p> <p>The SMC must have the capability to produce standard or customized reports through use of the site report generator, from user requests through output to selected media.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |

| | |
|------------|---|
| SMC-8840#A | <p>This requirement is performed at the SMC, and the test verification method is used.</p> <p>The SMC shall have the capability to generate detailed and summary reports indicating the performance of ground resources, including, at a minimum:</p> <ul style="list-style-type: none"> a. Resource availability b. Reason for down time c. Resource utilization d. Ability of resource to meet performance criteria e. Short and long-term trend analysis and capacity planning results <p>A report is generated showing the site performance of ground resources, including resource availability, reason for down time, resource utilization, the ability of resource to meet the performance criteria, and short and long-term trend analysis and capacity planning results.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |
| SMC-8841#A | <p>This requirement is performed at the SMC using the office automation tools. The test verification method is employed.</p> <p>The SMC shall have the capability to generate detailed and summary user feedback analysis reports describing the results of analyzing user satisfaction queries, including, at a minimum:</p> <ul style="list-style-type: none"> a. User information b. Type of transaction c. Satisfaction statistics d. User recommendations e. SMC recommendations <p>The SMC must have the capability to produce standard or customized reports through use of the site report generator, from user requests through output to selected media.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |
| SMC-8860#A | <p>This requirement is performed at the SMC using the office automation tools. The test verification method is employed.</p> <p>The SMC shall have the capability to generate detailed and summary fault management reports describing the fault management of ground resources, including, at a minimum:</p> <ul style="list-style-type: none"> a. Fault type and description b. Time of occurrence of fault c. Effect on system d. Status of fault resolution e. Fault statistics <p>A report is generated showing the site fault management reports describing the fault management of ground resources, including, fault type and description, time of occurrence of fault, effect on system, status of fault resolution, and fault statistics.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> |

| | | | | |
|---|---|-----------|-------------|---------|
| SMC-8880#A | <p>This requirement is performed at the SMC. Capabilities d, e, and g are performed by the M&O staff which generates reports using the office automation tools. Rest is automated. The test verification method is used.</p> <p>The SMC shall have the capability to generate detailed and summary security compromise reports indicating security compromises of ground resources and facilities, including, at a minimum:</p> <ul style="list-style-type: none">a. Security compromise type and descriptionb. Time of occurrencec. Cause of security compromised. Impact on systeme. Status of security compromise resolutionf. Security compromise statisticsg. Results of security compromise risk analysis <p>A report is generated showing the site security compromise reports indicating security compromises of ground resources and facilities, including, security compromise type and description, time of occurrence, cause of security compromise, impact on system, status of security compromise resolution, security compromise statistics, and results of security compromise risk analysis.</p> <p>Information generated at the SMC will be accessed for use in this test procedure.</p> | | | |
| Test Inputs: Specifications for the as-built report generator for the SMC. | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| | | | | |

| Step-By-Step Procedures | | |
|--------------------------------|--|-------------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | SMC Performance Analyst: Verify that there is a fully operational site computer configuration. | |
| 20 | SMC Performance Analyst: Verify that the site report generator and input data sets are available for access. | |
| 30 | Expected Results: Data sets representative of the full range of data types are available to be operated on by the report generator. | |
| 40 | SMC Performance Analyst: Request use of the site report generator to produce a standard report. | |
| 50 | Expected Results: Display of steps involved in producing standard or customized reports through use of the site report generator, from user request through output to selected media. | |
| 60 | SMC Performance Analyst: Define a report that generates detailed and summary information on training programs, training course schedules, training course contents, training course locations, and training attendees. | |
| 70 | Expected Results: Output includes a complete demonstration report that compares with the expected information. | |
| 80 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 90 | SMC Performance Analyst: Define a report that generates summary information showing the site inventory of hardware, system and scientific software, and spares and consumables. | |
| 100 | Expected Results: Output includes a complete demonstration report . | |
| 110 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 120 | SMC Performance Analyst: Define a report that generates information showing site proposed enhancements with a proposal name, description of enhancement, rationale, impacts, costs, and milestone schedule. | |
| 130 | Expected Results: Output includes a complete demonstration report . | |
| 140 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 150 | SMC Performance Analyst: Define a report that generates information showing the site performance of ground resources, including resource availability, reason for down time, resource utilization, the ability of resource to meet the performance criteria, and short and long-term trend analysis and capacity planning results. | |

| | | |
|---|---|--------------|
| 160 | Expected Results: Output includes a complete demonstration report . | |
| 170 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 180 | SMC Performance Analyst: Define a report that generates information showing the site fault management reports describing the fault management of ground resources, including, fault type and description, time of occurrence of fault, effect on system, status of fault resolution, and fault statistics. | |
| 190 | Expected Results: Output includes a complete demonstration report . | |
| 200 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 210 | SMC Performance Analyst: Define a report that generates information showing the site security compromise reports indicating security compromises of ground resources and facilities, including, security compromise type and description, time of occurrence, cause of security compromise, impact on system, status of security compromise resolution, security compromise statistics, and results of security compromise risk analysis. | |
| 220 | Expected Results: Output includes a complete demonstration report . | |
| 230 | SMC Performance Analyst: The output format is evaluated for correctness as well as readability and satisfactory presentation. | |
| 240 | SMC Performance Analyst: Each of the previous report demonstrations is evaluated for adherence to report format and content specifications. | |
| 250 | Expected Results: The outputs include completed demonstration reports that compare expected versus actual outputs. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

8.6.4.2 LSM Report Generation

This test procedure is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

This page intentionally left blank.

9. Push Scenario Group

This scenario group is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

This page intentionally left blank.

10. Pull Scenario Group

This scenario group is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

This page intentionally left blank.

11. Flight Operations Scenario Group

The Flight Operations Scenario Group is not applicable to this Volume. Refer to “Release A System Acceptance Test Procedures for the ECS Project, Volume 3: Earth Observing System (EOS) Operations Center (EOC)” for FOS procedures.

This page intentionally left blank.

12. End-to-End Scenario Group

The End-to-End Scenario Group verifies the SMC capabilities to support "all-up" multi-site operations and typical "day-in-the-mission-life" scientist activities. This group of scenarios and associated tests verifies that the SMC can support broad, multi-site interactive operations in support of mission planning, scheduling and science data access, processing and distribution.

In addition, early selected AM-1 mission interfaces needed in Release B, some of which are still being implemented, are tested and/or simulated. All of the interfaces and data flows depicted earlier in Figure 7-1 are verified in the execution of these scenarios. The overall objective of the end-to-end scenario group is to demonstrate that the ECS, as a 'whole', operates properly and can provide the full range of required functional capabilities for the TRMM Release.

12.1 Multi-Site Intercommunications and Interoperations Scenario

This scenario carries the ECS site operations staff through the process of handling complex data product orders that requires supporting data from multiple sites. This scenario confirms the capability of the system to allow users and operators to perform message broadcasting, multi-site system management and inter-site network communications. This scenario confirms inter-site interfaces, with each site accepting and interpreting data messages from other sites to ensure readiness to support interactive message traffic among the Release A DAACs, the SMC, TSDIS, EOC and EBnet. Also, the capability of the SMC to support system wide schedule generation, coordination and adjudication is confirmed.

12.1.1 Inter-Site Message Sequence

This sequence of tests verifies the capability of the operator(s) at the SMC to receive and handle broadcast messages. The SMC's operator(s) broadcast messages to the DAACs and receive message receipt acknowledgments.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS & ISS.

External Interfaces: The external interface needed for this sequence are listed:

- GSFC ECS DAAC
- EDC ECS DAAC
- LaRC ECS DAAC

Operator Position(s): The operator positions, from the ECS Maintenance and Operations Position Descriptions document, needed to support this sequence are listed:

- SMC Computer Operator
- SMC Resource Controller

Operational Scenario(s): There are no operations scenarios, taken from the Operations Scenarios for the ECS Project: Release A document, used during this sequence of tests.

Test Dependencies: The following table identifies the test procedure(s) for this sequence of tests that should be run prior to or concurrently with this sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------|---|-------------|
| A120110.020\$\$ | GSFC/A120110.020 \$G GSFC/A120110.020 \$E GSFC/A120110.020 \$L | Concurrent. |

12.1.1.1 Inter-DAAC and DAAC-SMC Communications

| | | | | | |
|--|--------------------|---|--------------------|------------------------|--|
| TEST Procedure No.: A120110.020\$\$ | | Date Executed: | | Test Conductor: | |
| Title: Inter-DAAC and DAAC-SMC Communications | | | | | |
| Objective: This procedure tests the capability of the SMC to send messages to and receive messages from the Release A DAACs, TSDIS, EBnet, and the EOC. | | | | | |
| Requirements | | Acceptance Criteria | | | |
| EOSD0730#A | | <p>This requirement is verified through test.</p> <p>Each ECS element shall be capable of verifying the fidelity of the ECS element interface to:</p> <ul style="list-style-type: none">a. Other ECS elements at any time during the lifetime of the ECSb. Entities external to ECS at any time during the lifetime of the ECS <p>Item ‘a’ of this requirement is verified when:</p> <ul style="list-style-type: none">1. the SMC sends policies, directives, procedures, and conflict resolutions to the Release A DAACs via electronic mail, telephone, and kftp2. and the SMC receives conflict resolution request, status, and performance from the Release A DAACs via electronic mail, telephone, and kftp. <p>Item ‘b’ if this requirement is verified when:</p> <ul style="list-style-type: none">1. the SMC sends status requests to TSDIS and EOC via the Internet and EBnet, respectively,2. and the SMC receives status from TSDIS and EOC; the SMC receives status, fault, and performance via EBnet. | | | |
| Test Inputs: | | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version | |
| PLANNING_001 | TBD | TBD | TBD | 1 | |
| SCHEDULE_001 | TBD | TBD | TBD | 1 | |
| DIRECTIVE_001 | TBD | TBD | TBD | 1 | |
| EMAIL_001 | TBD | TBD | TBD | 1 | |

| Step-By-Step Procedures | | |
|-------------------------|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | Assumption: SMC Operations Supervisor has received ESDIS policies, procedures, and directives. Tester activated the TSDIS simulator from a user terminal. | |
| 10 | SMC Operations Supervisor: Enters received ESDIS policies, procedures, and directives into the CSS Bulletin Board. | |
| 20 | Expected Results: Once the information is posted to the Bulletin Board, the SMC Operations Supervisor receives a return status that the information is posted. | |
| | DAACs Specific & System-wide Event Schedules | |
| 30 | SMC Resource Controller: Receives notification of DAAC site schedule posted to DAAC's server for retrieval by SMC or other DAAC sites.. | |
| 40 | Expected Results: The GSFC DAAC schedule has been posted to the DAAC's server and can be accessed. | |
| 50 | SMC Resource Controller: Receives notification of DAAC site schedule post to the LaRC DAAC server for retrieval by SMC or other DAAC sites. | |
| 60 | Expected Results: The LaRC DAAC schedule has been posted to the LaRC DAAC server. | |
| 70 | SMC Resource Controller: Establish kftp connectivity with the GSFC and LaRC DAACs. | |
| 80 | Expected Results: Kftp connectivity between the SMC and the DAACs is established. | |
| 90 | Tester: Retrieve posted site schedules from GSFC and LaRC DAACs. | |
| 100 | Expected Results: Schedules are retrieved uncorrupted. | |
| | Status Request to TSDIS | |
| 200 | Tester: From the SMC Resource Controller, generates a status request and sends it to TSDIS simulator via email. | |
| 210 | Expected Results: TSDIS simulator receives email. | |
| 220 | Tester: At the TSDIS simulator, opens the email message and access the status request. | |
| 230 | Expected Results: Status Request is not corrupted | |
| 240 | Tester: At the TSDIS simulator, generates status message and emails it to the SMC. | |
| 250 | Expected Results: SMC receives email from TSDIS simulator. | |
| 260 | Tester: At the SMC Resource Controller workstation opens the email and access the status information | |
| 270 | Expected Results: Status information was not corrupted. | |
| | Status Request | |

| | | |
|---|---|--------------|
| 320 | Tester: At the SMC Resource Controller workstation, access Communications Server and invoke kFTP client, and establish connectivity to the EOC. | |
| 330 | Expected Results: Connectivity to the EOC is established. | |
| 340 | Tester: Kftp status request to the EOC. | |
| 350 | Expected Results: Tester receives status information and performance summary data from the EOC (LSM). | |
| 360 | Tester: At the SMC Resource Controller workstation, sends a status request to the EBnet (via HPOV). | |
| 370 | Expected Results: Tester receives status information from the EBnet. | |
| Data Reduction and Analysis Steps: A. The following materials must be secured for analysis at the end of the procedure: 1. email Log Printout 2. Administrator Log Printout of kFTP Activities. B. Analysis of the email Log Printout must verify that all email activities are completed to required specifications. C. Analysis of email transmissions must verify that the integrity of the messages is consistent before and after transmission. D. Analysis of kFTP Log Printout must verify that the files are transferred to the required directory without corruption. | | |
| Signature: | | Date: |

12.1.2 Multi-Site System Management Sequence

This sequence of tests verifies the capability of the ECS SMC to support multi-site scheduling of activities related to TRMM instrument data ingest, processing, retrieval and distribution and to support AM-1 interfaces. This sequence also verifies the capability to interface and exchange schedule related messages and data with the DAACs.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: The external interfaces needed for this sequence are listed:

EDC ECS DAAC

GSFC ECS DAAC

LaRC ECS DAAC

Operator Position(s): The operator position(s), from the ECS Maintenance and Operations Position Descriptions document, needed to support this sequence are listed:

SMC Operations Supervisor

SMC Computer Operator

SMC Resource Controller

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release A document, that were used to develop tests in this sequence of tests are listed:

Resource Planning Scenario (Section 3.7.1)

Network Data Distribution (Push) Scenario (Nominal) (Section 3.11.2)

Network Data Distribution (Push) Scenario (Fault) (Section 3.11.3)

Network Data Distribution (Pull) Scenario (Section 3.11.5)

Test Dependencies: The following table identifies the test procedure(s) for this sequence of tests that should be run prior to or concurrently with this sequence or test procedure.

| Test No. | Procedure | Site/Procedure No. | Comments |
|-------------|-----------|--|------------|
| A120120.010 | \$S | GSFC/A120120.010\$G LaRC/A120120.010\$L | Concurrent |
| A120120.020 | \$S | GSFC/A120120.010\$G LaRC/A120120.010\$L | Concurrent |

12.1.2.1 Schedule Generation, Coordination and Adjudication Support

| | | |
|--|--|------------------------|
| TEST Procedure No.: A120120.010\$\$ | Date Executed: | Test Conductor: |
| Title: | Schedule Generation, Coordination and Adjudication Support | |
| Objective: | This Procedure tests the capabilities of the SMC to exchange among ECS elements and external entities, relevant schedule and resource data; the ability to generate schedule related inputs, to coordinate among the responsible parties in supporting of an overall EOSDIS schedule. Also this procedure test the capability of the SMC to communicate negotiate schedule conflicts, and develop an adjudicated schedule for the resolution of these conflicts. | |
| Requirements | Acceptance Criteria | |
| SMC-1300#A | <p>This requirement is verified through test.</p> <p>The SMC shall support and maintain the ECS policies and procedures regarding instrument and ground event scheduling, including, at a minimum:</p> <ul style="list-style-type: none">a. Mission and science guidelinesb. Directives for scheduling instrument data ingest, processing, reprocessing, retrieval, and data distribution <p>This requirement is verified when:</p> <ul style="list-style-type: none">1. the SMC import documentation from other word processing packages into its MSS Office Automation word processor;2. the SMC prepares and revise policies and procedures;3. the SMC distributes ECS policies and procedures to the DAACs; and the SMC receives conflict resolution requests from the DAACs. | |
| SMC-1310#A | <p>This requirement is verified through test.</p> <p>The SMC shall support and maintain the ground event functions and capabilities to each site and element.</p> <p>The SMC must be able to receive status and performance information from each DAAC.</p> | |
| SMC-1320#A | <p>This requirement is verified through test.</p> <p>The SMC shall support and maintain priorities used in scheduling ground events.</p> <p>The SMC must be able to manually handle ground events through the use of office automation tools based on the resource planning at each site.</p> | |
| SMC-1340#A | <p>This requirement is verified through test.</p> <p>The SMC shall generate scheduling directives for system level, site-to-site, and element-to-element integration, testing, and simulation activities.</p> <p>This requirement is verified when the tester is able to retrieve files from the available bulletin board and send the file, via email, to the appropriate ECS DAAC.</p> | |
| SMC-1360#A | <p>This requirement is verified through test.</p> <p>The SMC shall generate ground resource scheduling directives, or recommendations for FOS elements, in response to emergency situations.</p> <p>This requirement is verified when the tester is able to retrieve files from the available bulletin board and send the file, via email, to the EOC.</p> | |
| Test Inputs: Simulated Schedules from the EOC, GSFC DAAC and LaRC DAAC. | | |

| Step-By-Step Procedures | | |
|---|---|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | Assumption: SMC Operations Supervisor received approved ESDIS/SMC amendments to ECS policies and procedures regarding instrument and ground event scheduling. | |
| 10 | SMC Operations Supervisor: Enter the ECS policies and procedures amendments into the CSS Bulletin Board. | |
| 20 | Expected Results: SMC Operations Supervisor receives a return status that the information is posted to the Bulletin Board. | |
| | Pause | |
| 30 | Tester: At the GSFC DAAC, invoke the kftp client and establish connectivity with SMC. | |
| 40 | Expected Results: Kftp connectivity between the GSFC DAAC and the SMC is established. | |
| 50 | Tester: At the DAAC, send Conflict Resolution Request to the SMC. | |
| 60 | Expected Results: SMC receive notification of a message. | |
| 70 | Tester: At the SMC, access message. | |
| 80 | Expected Results: The Conflict Resolution Request is uncorrupted. | |
| | Pause Tester, at the SMC, manually resolve the schedule conflict based on ESDIS/SMC directives, policies, and procedures and each DAAC site schedule. | |
| 90 | Tester: Notify the GSFC and LaRC DAAC personnel of the conflict resolution via email. | |
| 100 | Expected Results: Email is sent successfully. | |
| | Pause SMC receive notifications of GSFC and LaRC DAACs schedule posted to the DAAC's server. | |
| 110 | Tester: As the SMC Resource Controller, establish kftp connectivity with the GSFC and LaRC DAACs. | |
| 120 | Expected Results: Kftp connectivity between SMC and GSFC and LaRC DAAC is established. | |
| 130 | Tester: As the SMC Resource Controller, retrieve the posted schedules and verify the schedule conflict is resolved. | |
| 140 | Expected Results: Schedule conflict is resolved. | |
| Data Reduction and Analysis Steps: | | |
| Signature: | | Date: |

12.1.2.2 TRMM and AM-1 Resource Scheduling Support

This test procedure is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.1.2.3 SMC Support to Integration Test and Simulation Activities

| | | |
|--|---|------------------------|
| TEST Procedure No.: A120120.030\$\$ | Date Executed: | Test Conductor: |
| Title: | SMC Support to Integration Test and Simulation Activities | |
| Objective: | This Procedure tests the capabilities of the SMC to support ECS integration, test and simulation activities. | |
| Requirements | Acceptance Criteria | |
| SMC 1330#A | This requirement is verified through test. The SMC shall support and maintain the information for end-to-end data ingest, processing, reprocessing, archive, and data distribution for each product, including , at a minimum: a. Product information b. Product generation information c. Product delivery information This requirement is verified | |
| SMC-1340#A | This requirement is verified through test. The SMC shall generate scheduling directives for system level, site-to-site, and element-to-element integration, testing, and simulation activities. This requirement is verified when the tester is able to retrieve files from the CSS Bulletin Board Service and send the file, via email, to the appropriate ECS DAAC | |
| SMC-1360#A | This requirement is verified through test. The SMC shall generate ground resource scheduling directives, or recommendations for FOS elements, in response to emergency situations. This requirement is verified when the tester is able to retrieve files from the CSS Bulletin Board Service and send the file, via email, to the EOC. | |
| SMC-1310#A | This requirement is verified through test. The SMC shall support and maintain the allocation of ground event functions and capabilities to each site and element. This requirement is verified when the tester is able to send and receive email, retrieve files from the appropriate bulletin board, collect performance information, and generating performance report. | |
| Test Inputs: Simulated Schedules from the EOC, GSFC DAAC and LaRC DAAC. | | |

| Step-By-Step Procedures | | |
|-------------------------|--|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | Assumption: SMC Resource Controller has received site schedules from each DAAC and the EOC. | |
| 10 | SMC Resource Controller: Enters received ESDIS policies, procedures, and directives into the CSS Bulletin Board. | |
| 20 | Expected Results: Once the information is posted to the Bulletin Board, the SMC Operations Supervisor receives a return status that the information is posted. | |
| | DAACs Specific & System-wide Event Schedules | |
| 30 | SMC Resource Controller: Receives notification of DAAC site schedule posted to DAAC's server for retrieval by SMC or other DAAC sites.. | |
| 40 | Expected Results: The GSFC DAAC schedule has been posted to the DAAC's server and can be accessed. | |
| 50 | SMC Resource Controller: Receives notification of DAAC site schedule post to the LaRC DAAC server for retrieval by SMC or other DAAC sites. | |
| 60 | Expected Results: The LaRC DAAC schedule has been posted to the LaRC DAAC server. | |
| 70 | SMC Resource Controller: Establish kftp connectivity with the GSFC and LaRC DAACs. | |
| 80 | Expected Results: Kftp connectivity between the SMC and the DAACs is established. | |
| 90 | Tester: Retrieve posted site schedules from GSFC and LaRC DAACs. | |
| 100 | Expected Results: Schedules are retrieved uncorrupted. | |
| | Status Request to TSDIS | |
| 200 | Tester: From the SMC Resource Controller, generates a status request and sends it to TSDIS simulator via email. | |
| 210 | Expected Results: TSDIS simulator receives email. | |
| 220 | Tester: At the TSDIS simulator, opens the email message and access the status request. | |
| 230 | Expected Results: Status Request is not corrupted | |
| 240 | Tester: At the TSDIS simulator, generates status message and emails it to the SMC. | |
| 250 | Expected Results: SMC receives email from TSDIS simulator. | |
| 260 | Tester: At the SMC Resource Controller workstation opens the email and access the status information | |
| 270 | Expected Results: Status information was not corrupted. | |
| | Status Request | |

| | | |
|-----|---|--|
| 320 | Tester: At the SMC Resource Controller workstation, access Communications Server and invoke kFTP client, and establish connectivity to the EOC. | |
| 330 | Expected Results: Connectivity to the EOC is established. | |
| 340 | Tester: Kftp status request to the EOC. | |
| 350 | Expected Results: Tester receives status information and performance summary data from the EOC (LSM). | |
| 360 | Tester: At the SMC Resource Controller workstation, sends a status request to the EBnet (via HPOV). | |
| 370 | Expected Results: Tester receives status information from the EBnet. | |
| | Assumption: SMC Operations Supervisor received approved ESDIS/SMC amendments to ECS policies and procedures regarding instrument and ground event scheduling. | |
| 380 | SMC Operations Supervisor: Enter the ECS policies and procedures amendments into the CSS Bulletin Board. | |
| 390 | Expected Results: SMC Operations Supervisor receives a return status that the information is posted to the Bulletin Board. | |
| | Pause | |
| 400 | Tester: At the GSFC DAAC, invoke the kftp client and establish connectivity with SMC. | |
| 410 | Expected Results: Kftp connectivity between the GSFC DAAC and the SMC is established. | |
| 420 | Tester: At the DAAC, send Conflict Resolution Request to the SMC. | |
| 430 | Expected Results: SMC receive notification of a message. | |
| 440 | Tester: At the SMC, access message. | |
| 450 | Expected Results: The Conflict Resolution Request is uncorrupted. | |
| | Pause Tester, at the SMC, manually resolve the schedule conflict based on ESDIS/SMC directives, policies, and procedures and each DAAC site schedule. | |
| 460 | Tester: Notify the GSFC and LaRC DAAC personnel of the conflict resolution via email. | |
| 470 | Expected Results: Email is sent successfully. | |
| | Pause SMC receive notifications of GSFC and LaRC DAACs schedule posted to the DAAC's server. | |
| 480 | Tester: As the SMC Resource Controller, establish kftp connectivity with the GSFC and LaRC DAACs. | |
| 490 | Expected Results: Kftp connectivity between SMC and GSFC and LaRC DAAC is established. | |
| 500 | Tester: As the SMC Resource Controller, retrieve the posted schedules and verify the schedule conflict is resolved. | |
| 510 | Expected Results: Schedule conflict is resolved. | |

Data Reduction and Analysis Steps:

A. The following materials must be secured for analysis at the end of the procedure:

1. email Log Printout
2. Administrator Log Printout of kFTP Activities.

B. Analysis of the email Log Printout must verify that all email activities are completed to required specifications.

C. Analysis of email transmissions must verify that the integrity of the messages is consistent before and after transmission.

D. Analysis of kFTP Log Printout must verify that the files are transferred to the required directory without corruption.

Signature:

Date:

12.2 TRMM Mission Support Scenario

This scenario is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.3 AM-1 End-to-End Scenario

This scenario is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.4 Science Data Access an Interoperability Scenario

This scenario is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5 System Performance Scenario

The system performance scenario demonstrates overall SMC performance capabilities as well as its ability to expand and evolve without changes to design. The focus is on performance measures which are distributed among several elements and cannot be confirmed by single element testing. An example is the ECS end-to-end response time in commanding an instrument to return core data. Other performance measures are the ability to handling triple the average daily rate of science data, handling transactions and processing within prescribed response time envelopes, confirming archiving capacity of DAACs, and archiving triple the average daily rate of science data and distributing data within the required times.

The performance requirements, as specified in ECS documentation, are verified under specified operational conditions. The emphasis is on testing in a simulated or near real operational environment, typifying moderately loaded and busy system conditions. Response time, archiving capacity and expansion capability performance measures are emphasized.

The scenario verifies the SMC capability to generate and gather statistics and measure performance pertaining to ECS operations. Measurement and analysis of resource utilization and operational statistics are used to confirm ECS system performance.

12.5.1 Data Ingest, Data Server and Data Distribution Performance Sequence

This sequence is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5.2 System Response Time Performance Sequence

This sequence is not valid for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5.3 ECS Evolution, and Growth Sequence

This sequence verifies through analysis the capabilities of the SMC to adequately grow and evolve.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: There are no external interfaces needed for this sequence.

Operator Positions: There are no operator positions needed for this sequence.

Operational Scenario: There are no operations scenarios, taken from the Operations Scenarios for the ECS Project: Release A document, used during this sequence of tests.

Test Dependencies: There are no test dependencies needed for this sequence of tests.

12.5.3.1 Accommodation of ECS Expansion Analysis

This test procedure is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5.3.2 ECS Growth and Evolution Adequacy Analyses

| | | |
|---|---|------------------------|
| TEST Procedure No.: A120530.020\$\$ | Date Executed: | Test Conductor: |
| Title: ECS Growth and Evolution Adequacy Analyses | | |
| Objective: These analyses verify the capabilities of the SMC in support of the ECS to evolve to meet future EOS processing requirements. | | |
| Requirements | Acceptance Criteria | |
| SMC-0300#A | This requirement is verified through analysis. The SMC shall be designed to accommodate 100 percent growth in processing speed without requiring modifications or upgrades to existing applications software. Analytic and static analysis models along with daily performance reports are used to verify this requirement. | |
| SMC-0310#A | This requirement is verified through analysis. The SMC shall be designed to accommodate 100 percent growth in storage capacity without requiring modifications or upgrades to existing applications software. Static analysis models and the daily performance report are used to verify this requirement. | |
| SMC-3420#A | This requirement is verified through analysis. The SMC shall perform short and long-term trend analysis of system, site, and element performance to determine the impact on resources of, at a minimum: a. Modifying system, site, or element activity allocations b. Potential enhancement to system, site, or element This requirement is verified when using the Tivoli and OpenView tools to and daily performance reports are used to verify this requirement. | |
| Test Inputs: There are no input data sets for this test procedure. | | |

| Step-By-Step Procedures | | |
|--|---------------------------------------|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | There are no step-by-step procedures. | |
| Data Reduction and Analysis Steps: A. Analytic and static analysis models along with daily performance reports from the Release A DAACs and EBnet will be used to verify the design of SMC to accommodate 100 percent growth in processing speed. B. Static analysis models along with daily performance reports from the Release A DAACs and EBnet will be used to verify the design of SMC to accommodate 100 percent growth in storage capacity. C. Performance reports from the Release A DAACs and EBnet are used for DAACs site and network trend analysis. The Tivoli and OpenView tools are used at the SMC to determine resources impact. | | |
| Signature: | | Date: |

12.5.4 ECS Testability and Overall Capabilities Sequence

This sequence verifies the SMC's capability to support testing in all phases of the development and mission life cycle and verifies system requirements for broad overall functional capabilities.

Configuration: The subsystems needed to perform this sequence of tests are as follows: CSS, MSS, CLS and ISS.

External Interfaces: There are no external interfaces needed for this sequence.

Operator Position(s): There are no operator positions needed for this sequence.

Operational Scenario(s): There are no operations scenarios, taken from the Operations Scenarios for the ECS Project: Release A document, used during this sequence of tests.

Test Dependencies: There are no test dependencies needed for

12.5.4.1 Test Support in an Operational DAAC

This test procedure is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5.4.2 Support of Lifecycle Testing

This test procedure is not applicable for the SMC Volume of the Acceptance Test Procedures document for Release A.

12.5.4.3 ECS Overall Capabilities

| TEST Procedure No.: A120540.030\$\$ | Date Executed: | Test Conductor: |
|--|--|------------------------|
| Title: ECS Overall Capabilities | | |
| Objective: To verify the evolutionary and growth requirements of the ECS. | | |
| Requirements | Acceptance Criteria | |
| EOSD5020#A | This requirement is verified through analysis. ECS software, hardware, and interface shall enable transparent portability across heterogeneous site architectures, i.e. performing the same function at different sites that may have different hardware implementations. The CSS, MSS, and ISS, at the SMC, must be able to provide the same functionality which are provide at the DAACs with the addition of the following functions: <ol style="list-style-type: none">1. CSS provides bulletin board service2. and MSS provides both local and enterprise-wide management view. | |
| SMC-3380#A | This requirement is verified through analysis. The SMC shall evaluate overall system performance. A report on overall system performance (to include schedule performance, resource utilization, performance testing, etc.) will be generated. | |
| SMC-3420#A | This requirement is verified through analysis. The SMC shall perform short and long-term trend analysis of system, site, and element performance to determine the impact on resources of, at a minimum: <ol style="list-style-type: none">a. Modifying system, site, or element activity allocationsb. Potential enhancement to system, site, or element This requirement is verified when using the various performance management tools to determine the resource impact. | |

| Step-By-Step Procedures | | |
|---|---------------------------------------|------------------------|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| | There are no step-by-step procedures. | |
| Data Reduction and Analysis Steps: I. The SMC manually generates a systems-wide performance report based upon the following information: A. Status and performance data from the Release A DAACs, B. Status data from TSDIS, C. Status, fault, and performance data from EBnet, and D. Status data from the EOC. Performance reports from the Release A DAACs and EBnet are used for DAACs site and network trend analysis. The Tivoli and OpenView tools are used at the SMC to determine resources impact. | | |
| Signature: | | Date: |

Appendix A. Test Sequences Mapped to External Interfaces

The left column of this table lists each interface external to the Release A ECS SMC. In the right column is a list of test sequences which contains tests involving that external interface.

Table A-1. External Interface Sequences

| External Interface | SMC Test Sequence |
|--------------------|--|
| EDC ECS DAAC | 8.1.3 Site Operations Sequence 8.1.7 Facilities Interfaces Sequence 8.2.1 Schedule Generation Sequence 8.2.2 Schedule Adjudication Sequence 8.3.1 Enhancements Sequence 8.4.1 Resource Management Sequence 8.4.2 Maintenance Management Sequence 8.4.3 Logistics Management Sequence 8.4.4 Training Management Sequence 8.4.5 Inventory Management Sequence 8.4.6 Quality Management Sequence 8.4.7 Policies and Procedures Management Sequence 8.5.1 Metrics Sequence 8.5.2 Performance Monitoring, Analysis & Testing Sequence 8.6.1 Fault Management Sequence 8.6.2 Security Management Sequence 8.6.4 Report Generation Sequence 12.1.1 Inter-Site Message Sequence 12.1.2 Multi-Site System Management Sequence |
| EOC | 8.1.3 Site Operations Sequence 8.1.7 Facilities Interfaces Sequence 8.5.1 Metrics Sequence 8.6.1 Fault Management Sequence 8.6.2 Security Management Sequence |

| External Interface | SMC Test Sequence |
|--------------------------|--|
| GSFC ECS DAAC | 8.1.3 Site Operations Sequence 8.1.7 Facilities Interfaces Sequence 8.2.1 Schedule Generation Sequence 8.2.2 Schedule Adjudication Sequence 8.3.1 Enhancements Sequence 8.4.1 Resource Management Sequence 8.4.2 Maintenance Management Sequence 8.4.3 Logistics Management Sequence 8.4.4 Training Management Sequence 8.4.5 Inventory Management Sequence 8.4.6 Quality Management Sequence 8.4.7 Policies and Procedures Management Sequence 8.5.1 Metrics Sequence 8.5.2 Performance Monitoring, Analysis & Testing Sequence 8.6.1 Fault Management Sequence 8.6.2 Security Management Sequence 8.6.4 Report Generation Sequence 12.1.1 Inter-Site Message Sequence 12.1.2 Multi-Site System Management Sequence |
| LaRC ECS DAAC | 8.1.3 Site Operations Sequence 8.1.7 Facilities Interfaces Sequence 8.2.1 Schedule Generation Sequence 8.2.2 Schedule Adjudication Sequence 8.3.1 Enhancements Sequence 8.4.1 Resource Management Sequence 8.4.2 Maintenance Management Sequence 8.4.3 Logistics Management Sequence 8.4.4 Training Management Sequence 8.4.5 Inventory Management Sequence 8.4.6 Quality Management Sequence 8.4.7 Policies and Procedures Management Sequence 8.5.1 Metrics Sequence 8.5.2 Performance Monitoring, Analysis & Testing Sequence 8.6.1 Fault Management Sequence 8.6.2 Security Management Sequence 8.6.4 Report Generation Sequence 12.1.1 Inter-Site Message Sequence 12.1.2 Multi-Site System Management Sequence |
| TSDIS (Simulator) | 8.1.7 Facilities Interfaces Sequence |

Appendix B. Test Sequences Mapped to Operations Scenarios

The left column of this table lists each operational scenario from the ECS Operations Scenarios - Release A (605/OP1). In the right column is a list of test sequences which contains tests involving that operational scenario.

Table B-1. Test Sequences Mapped to Operations Scenarios

| Operational Scenario | Test Sequence Number |
|---|--|
| 3.1 Computer System Administration Activities | |
| 3.1.1 ECS System Shutdown/Startup Scenario | 8.1.2 Site Startup Sequence |
| 3.1.2 Computer System Administration Backup & Restore/Recovery | 8.1.4 Site Shutdown/Recovery Sequence 8.1.6 Site Data, Metadata Information Management Sequence |
| 3.2 Problem Management Activities | |
| 3.2.1 Trouble Ticket and Problem Tracking Scenario | 8.6.1 Fault Management Sequence |
| 3.3 Fault Management Activities | 8.4.7 Policies & Procedures Management Sequence |
| 3.3.1 Production Failure Scenario | Not applicable |
| 3.4 Configuration Management (CM) Activities | |
| 3.4.1 COTS Hardware Problem Scenario | Not applicable |
| 3.4.2 Hardware Emergency Change Scenario | Not applicable |
| 3.4.3 COTS Software Problem Scenario | Not applicable |
| 3.4.4 Custom Software Problem Scenario | Not applicable |
| 3.4.5 COTS Software Upgrade Scenario | Not applicable |

| Operational Scenario | Test Sequence Number |
|---|---|
| 3.4.6 Add New Science Algorithm Scenario | Not applicable |
| 3.4.7 System Enhancement Request Scenario | 8.3.1 Enhancements Sequence |
| 3.5 Performance Management Activities | 8.4.6 Quality Management Sequence |
| 3.5.1 Operations Support Scenario | 8.5.1 Metrics Sequence |
| 3.5.2 User Notes Performance Degradation | 8.5.1 Metrics Sequence 8.5.2 Performance Monitoring, Analysis & Testing Sequence |
| 3.5.3 Preparing for New Algorithm Scenario | 8.5.2 Performance Monitoring, Analysis & Testing Sequence |
| 3.5.4 Performance Trending Scenario | 8.5.2 Performance Monitoring, Analysis & Testing Sequence |
| 3.6 Security Management | |
| 3.6.1 Security Management Login Failure Scenario | 8.6.2 Security Management Sequence |
| 3.6.2 Accountability Management Create User Account Scenario | 8.6.3 Accounting and Accountability Sequence |
| 3.7 Resource Planning Activities | 8.4.1 Resource Management Sequence |
| 3.7.1 Resource Planning Scenario | 8.5.2 Performance Monitoring, Analysis & Testing Sequence 12.1.2 Multi-Site System Management Sequence |
| 3.8 Resource Management and Control Activities | 8.4.1 Resource Management Sequence |
| 3.8.1 Data Processing Host Routine Maintenance Scenario | Not applicable |
| 3.8.2 Installation of Software Upgrade Scenario | Not applicable |
| 3.9 Science Data Ingest Activities | |
| 3.9.1 TRMM Level 0 Data Ingest Scenario | Not applicable |
| 3.9.2 TRMM Data Ingest "Fault" Scenario | Not applicable |
| 3.9.3 TRMM Ancillary Data Ingest Scenario | Not applicable |
| 3.9.4 Hard Media Ingest Scenario | Not applicable |
| 3.9.5 Version 0 Data Ingest Scenario | Not applicable |
| 3.10 Science Data Archival Activities | |
| 3.10.1 Startup of a New Data Server Scenario (Nominal) | Not applicable |
| 3.10.2 Data Insertion Scenario (nominal) | Not applicable |
| 3.10.3 Data Insertion Scenario (fault) | Not applicable |
| 3.11 Science Data Distribution Activities | |

| Operational Scenario | Test Sequence Number |
|---|---|
| 3.11.1 Network Data Distribution (Pull) Scenario (Nominal) | 8.6.3 Accounting and Accountability Sequence |
| 3.11.2 Network Data Distribution (Push) Scenario (Nominal) | 12.1.2 Multi-Site System Management Sequence |
| 3.11.3 Network Data Distribution (Push) Scenario (Fault) | 12.1.2 Multi-Site System Management Sequence |
| 3.11.4 Hard Media Distribution Scenario | Not applicable |
| 3.11.5 Network Data Distribution (Pull) Scenario | 12.1.2 Multi-Site System Management Sequence |
| 3.12 Production Planning Activities | |
| 3.12.1 Routine Production Planning Scenario | Not applicable |
| 3.12.2 Replanning Production Scenario | Not applicable |
| 3.13 Production Processing | |
| 3.13.1 Normal Production Processing Scenario | Not applicable |
| 3.13.2 Production Processing Job Anomaly Scenario | Not applicable |
| 3.13.3 Production Processing Job Modification Scenario | Not applicable |
| 3.14 User Services Activities | |
| 3.14.1a End-to-End Order Tracking Scenario - Hard Media | Not applicable |
| 3.14.1b End-to-End Order Tracking Scenario - FTP | Not applicable |
| 3.14.2 Standard Procedures (Login) Scenario | Not applicable |
| 3.14.3 System Status Scenario | 8.4.8 Network Management Sequence |
| 3.14.4 Place an Order for a Potential User Scenario | Not applicable |
| 3.14.5 Non Conformance Report (Software problem) Scenario | 8.6.1 Fault Management Sequence |
| 3.14.6 Lost User Password Scenario | Not applicable |

This page intentionally left blank.

Appendix C. Test Procedures Mapped to M&O Operations Manual

This table lists each of the maintenance procedures from the Maintenance and Operations Procedures (DID 611) in the left column, and in the right column a list of test procedures which use that procedure.

Table C-1. Test Procedures Mapped to M&O Operations Manual

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 3. SYSTEM ADMINISTRATION | |
| 3.1 System Startup and Shutdown | |
| 3.1.1 Startup | |
| 3.1.1.1 Cold - By Subsystem | |
| 3.1.1.2 Warm - By Server Software | |
| 3.1.2 Shutdown | |
| 3.1.2.1 Normal - By Subsystem | |
| 3.1.2.2 Emergency - By Subsystem | |
| 3.1.2.3 Server - By Server Software | |
| 3.1.3 Failover | |
| 3.2 System Backup and Restore | |
| 3.2.1 Incremental Backup | |
| 3.2.2 Full Backup | |
| 3.2.3 File Restore | |
| 3.2.4 Complete System Restore | |
| 3.2.5 Tape Handling | |
| 3.2.5.1 Indexing Tapes | |
| 3.2.5.2 Labeling Tapes | |
| 3.3 System Log Maintenance | |
| 3.4 User Administration | |
| 3.4.1 Adding a User | |
| 3.4.2 Deleting a User | |
| 3.4.3 Changing a User Account Configuration | |
| 3.4.4 Changing User Access Privileges | |
| 3.4.5 Changing a User Password | |
| 3.4.6 Checking a File/Directory Access Privilege Status | |
| 3.4.7 Changing a File/Directory Access Privilege | |
| 3.4.8 Moving a User's Home Directory | |
| 3.5 Installing a New Workstation | |
| 3.5.1 Preparation | |
| 3.5.1.1 Hardware | |
| 3.5.1.2 Network Configuration | |
| 3.5.2 Installation | |
| 3.5.2.1 Hardware | |
| 3.5.2.1.1 Reporting to Inventory | |
| 3.5.2.2 Operating System Installation - By Operating System Type | |
| 3.5.2.2.1 Solaris 2.4 Operating System Installation | |
| 3.5.2.2.2 HP-UX 9.05 Operating System Installation | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 3.5.2.2.3 IRIX 5.3 and 6.2 Operating Systems Installation | |
| 3.5.2.2.4 NCD Operating System Installation | |
| 3.5.2.3 Software | |
| 3.5.2.3.1 Custom | |
| 3.5.2.3.2 COTS | |
| 3.5.3 Testing and Verification | |
| 3.5.3.1 Reboot | |
| 3.5.3.1.1 SGI, HP and Sun | |
| 3.5.3.1.2 NCD | |
| 3.5.3.2 Logging In | |
| 3.5.3.3 Test Environment | |
| 3.6 DCE Configuration | |
| 3.6.1 Initial Cell | |
| 3.6.2 DTS Servers | |
| 3.6.3 Additional CDS Servers | |
| 3.6.4 Security and CDS Client Systems | |
| 3.6.4.1 Unconfiguring DCE Client | |
| 3.6.5 DTS Clerks | |
| 3.6.6 CDS Servers | |
| 3.6.7 Creating a Security Server Replica | |
| 4. DATABASE ADMINISTRATION | |
| 4.1 Product Installation and Disk Storage Management | |
| 4.1.1 Installing SQL Server and Related Products and Upgrading New Version of SQL Server Products | |
| 4.1.2 Migrating Databases to New Version SQL Server | |
| 4.1.3 Allocating Resources | |
| 4.1.3.1 Allocating Disk Space: Creating Database Devices, Maintaining Database Segments | |
| 4.1.4 Monitoring and Managing Resource Utilization | |
| 4.1.4.1 Use of Available Disk Space, Memory, Connection Error Logs, State of Transaction Logs, Device Problems, etc. | |
| 4.2 SQL Server Lifecycle Maintenance | |
| 4.2.1 Starting the Server | |
| 4.2.2 Shutting Down the Server | |
| 4.3 SQL Server Logins and Privileges | |
| 4.3.1 Creating SQL Server Login Accounts | |
| 4.3.2 Add User to Database(s) | |
| 4.3.3 Granting Access Privileges | |
| To grant access privileges, the DBA must have the following TME administrator roles: | |
| 4.3.4 Modifying Access Privileges | |
| 4.4 Database Integrity | |
| 4.4.1 Checking Consistency | |
| 4.5 Database Backup and Recovery | |
| 4.5.1 Database Backup | |
| 4.5.2 Transaction Log Backup | |
| 4.6 ECS DAAC-Configured Databases | |
| 4.6.1 Database Size Estimates and Planning | |
| 4.6.2 Database-unique Attributes | |
| 4.6.3 Database Reports | |
| 4.7 Database Tuning and Performance Monitoring | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 4.7.1 Design and Indexing | |
| 4.7.2 Queries | |
| 4.7.3 Monitoring and Boosting Performance | |
| 4.8 Troubleshooting | |
| 4.8.1 Diagnosing Database System Problems | |
| 4.8.1.1 Reports | |
| 4.8.1.2 Queries | |
| 4.8.2 On-call User Support and Emergency Response | |
| 5. SECURITY SERVICES | |
| 5.1 Running Security Management Log Analyst Program | |
| 5.2 Reviewing User Activity Data | |
| 5.3 Monitoring and Reviewing User Audit Trail Information | |
| 5.4 Creating a DES User Key | |
| 5.4 Kerberos Authentication | |
| 5.5 SATAN | |
| 5.6 Using Crack | |
| 5.7 Npasswd | |
| 5.8 Tcp_wrappers | |
| 5.9 Tripwire | |
| 5.10 Recovering from Security Breaches | |
| 5.11 Reporting Security Breaches | |
| 6. NETWORK ADMINISTRATION | |
| 6.1 HPOpenView Network Node Manager (NNM) | |
| 6.1.1 Starting NNM (Network Node Manager) | |
| 6.1.2 Adding a Network Object | |
| 6.1.3 Adding a Segment Object | |
| 6.1.4 Adding a Node Object | |
| 6.1.5 Adding an IP Interface Object | |
| 6.1.6 Viewing the Current Network and System Configuration | |
| 6.1.7 Viewing Network Address Information | |
| 6.1.8 Viewing How Traffic is Routed on a Network | |
| 6.1.9 Viewing the Services Available on a Node | |
| 7. SYSTEM MONITORING | |
| 7.1 Checking the Health and Status of the Network | |
| 7.1.1 Starting NNM (Network Node Manager) | |
| 7.1.2 Verify That an Object Is Not Functioning | |
| 7.1.3 Looking at Maps for Color Alerts | |
| 7.1.4 Looking at Maps for New Nodes | |
| 7.1.5 Creating Special Submaps for Monitoring Status | |
| 7.1.6 Checking for Event Notifications | |
| 8. PROBLEM MANAGEMENT | |
| 8.1 Problem Resolution Process — An Overview | |
| 8.2 Using the Trouble Ticket System Tool | |
| 8.2.1 Accessing the Trouble Ticket System | |
| 8.2.1.1 Remedy's GUI Admin Tool | |
| 8.2.1.2 Remedy's GUI Import Tool | |
| 8.2.1.3 Remedy's Hardware Information Schema | |
| 8.2.1.4 Remedy's GUI Notification Tool | |
| 8.2.2 Submit a Trouble Ticket | |
| 8.2.3 Reviewing and Modifying Open Trouble Tickets | |
| 8.2.4 Forwarding Trouble Tickets | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 8.2.5 Adding Users to Remedy | |
| 8.2.6 Changing Privileges in Remedy | |
| 8.2.7 Modifying Remedy's Configuration | |
| 8.2.8 Generating Trouble Ticket Reports | |
| 8.2.9 Re-prioritization of Dated Trouble Ticket Logs | |
| 8.3 Using Hypertext Mark-up Language (HTML) Screens | |
| 8.3.1 ECS Trouble Ticketing HTML Submit Screen | |
| 8.3.2 ECS Trouble Ticketing HTML Success Screen | |
| 8.3.3 ECS Trouble Ticketing HTML List Screen | |
| 8.3.4 ECS Trouble Ticketing HTML Detailed Screen | |
| 8.3.5 ECS Trouble Ticketing HTML Help Screen | |
| 8.4 Emergency Fixes | |
| 8.5 Diagnosing Network Problems | |
| 8.5.1 Performance Management | |
| 9. CONFIGURATION MANAGEMENT | |
| 9.1 Configuration Identification Procedure | |
| 9.1.1 Purpose | |
| 9.1.2 Applicable to | |
| 9.1.3 References | |
| 9.1.4 Procedures | |
| 9.1.4.1 Extended Configuration Identification | |
| 9.1.4.2 Other Procedures as Applicable | |
| 9.2 Configuration Change Control Procedures | |
| 9.2.1 Purpose | |
| 9.2.2 Applicable to | |
| 9.2.3 References | |
| 9.2.4 Procedures | |
| 9.2.4.1 Configuration Change Request Preparation | |
| 9.2.4.2 Change Control Board Process (System and Site-level CCBs) | |
| 9.2.4.3 Configuration Control - Deviation and Waivers | |
| 9.3 Configuration Status Accounting Procedures | |
| 9.3.1 Purpose | |
| 9.3.2 Applicable to | |
| 9.3.3 References | |
| 9.3.4 Procedures | |
| 9.4 Configuration Audits | |
| 9.4.1 Purpose | |
| 9.4.2 Applicable to | |
| 9.4.3 References | |
| 9.4.4 Procedures | |
| 9.5 Data Management | |
| 9.5.1 Purpose | |
| 9.5.2 Applicable to | |
| 9.5.3 References | |
| 9.5.4 Procedures | |
| 9.5.4.1 Information Preparation, Submittal, & Cataloguing | |
| 9.5.4.1.1 Creation / Preparation | |
| 9.5.4.1.2 Submission | |
| 9.5.4.1.3 Identification and numbering | |
| 9.5.4.1.4 Logging / Cataloguing | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 9.5.4.2 Information Review, Signoff, Release and Change/Revision | |
| 9.5.4.2.1 Document/Test data Review, Release, and Change Procedures | |
| 9.5.4.2.2 Review/Release | |
| 9.5.4.2.3 Changes, Revision and Document Maintenance | |
| 9.5.4.3 Information Distribution and Submission to ESDIS/ ECS | |
| 9.5.4.3.1 Data / Document Distribution/Submittal to ESDIS/ ECS | |
| 9.5.4.3.2 Categories of CDRL Data Submitted to ESDIS/ ECS | |
| 9.5.4.3.3 Documentation Distribution | |
| 9.6 Archiving Procedures for the SW CM Manager (ClearCase) | |
| 9.6.1 Purpose | |
| 9.6.2 Applicable to | |
| 9.6.3 References | |
| 9.6.4 Procedures | |
| 9.7 SW Transfer and Installation | |
| 9.7.1 Purpose | |
| 9.7.2 Applicable to | |
| 9.7.3 References | |
| 9.7.4 Procedures | |
| 9.7.4.1 Overview | |
| 9.7.4.2 Operator Roles | |
| 9.7.4.3 Detailed Procedures | |
| 9.7.4.4 Data Activity | |
| 9.8 Change Request Manager | |
| 9.8.1 Configuration Change Request (CCR) | |
| 9.8.2 Accessing Change Request Manager | |
| 9.8.3 View a CCR | |
| 9.8.4 Submit a CCR | |
| 9.8.5 Change State of CCR | |
| 9.8.5.1 Assign-Eval State | |
| 9.8.5.2 Assign-Implement State | |
| 9.8.5.3 Assign-Verify State | |
| 9.8.5.4 Verify State | |
| 9.8.5.5 Close State | |
| 9.8.6 Modify CCR | |
| 9.8.7 Print CCR | |
| 9.8.8 Required Operating Environment | |
| 9.8.8.1 Interfaces and Data Types | |
| 9.8.8.2 Databases | |
| 9.8.8.3 Database Schema | |
| 9.8.8.4 Database Parameters | |
| 9.8.8.5 Command Line Interface | |
| 9.8.8.6 Event and Error Messages | |
| 9.8.9 Reports | |
| 9.8.9.1 Sample Reports | |
| 9.8.9.1.1 Sample Report (Full Page Format) | |
| 9.8.9.1.2 Sample Report (Three Line Format) | |
| 9.8.9.1.3 Sample Report (Index Format) | |
| 9.8.9.1.4 Sample Report (One Line Format) | |
| 9.8.9.2 Report Customization | |
| 9.9 Use of the Baseline Manager | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 9.9.1 Purpose | |
| 9.9.2 Applicable to | |
| 9.9.3 References | |
| 9.9.4 Procedures | |
| 10. METADATA ADMINISTRATION | |
| 10.1 Metadata Preparation | |
| 10.1.1 Creating Collection Level Metadata | |
| 10.1.2 Creating Product-specific Metadata | |
| 10.1.3 Specifying ESDT Services | |
| 10.2 Creating ESDTs | |
| 10.2.1 Selecting an ESDT | |
| 10.2.2 Creating an ESDT Descriptor | |
| 10.3 Loading Metadata | |
| 10.3.1 Inserting ODL into DSS | |
| 10.4 Metadata Maintenance | |
| 10.4.1 Updating Metadata | |
| 10.4.2 Editing Metadata | |
| 10.4.3 Deleting Metadata | |
| 11. SSI&T OPERATIONAL PROCEDURES | |
| 11.1 Acquiring the Delivered Algorithm Package (DAP) | |
| 11.1.1 Acquiring the DAP Through Ingest | |
| 11.1.2 Acquiring the DAP via FTP | |
| 11.2 Configuration Management | |
| 11.2.1 Creating and Using a View in ClearCase | |
| 11.2.2 Importing Multiple Files into ClearCase from a Directory Structure | |
| 11.2.3 Entering a Single File into ClearCase | |
| 11.2.4 Entering a New Directory into ClearCase | |
| 11.2.5 Checking Out an Element from ClearCase | |
| 11.2.6 Checking a Revised Element into ClearCase | |
| 11.3 SSIT Manager GUI | |
| 11.3.1 General Setup of the SSIT Manager | |
| 11.3.2 Setup of Checklist for SSIT Manager | |
| 11.3.3 Initial Setup of the SSIT Manager | |
| 11.3.4 Routine Running of the SSIT Manager | |
| 11.4 Standards Checking | |
| 11.4.1 Checking ESDIS Standards Compliance: FORTRAN 77 | |
| 11.4.2 Checking ESDIS Standards Compliance: Fortran 90 | |
| 11.4.3 Checking ESDIS Standards Compliance: C | |
| 11.4.4 Checking ESDIS Standards Compliance: Ada | |
| 11.4.5 Prohibited Function Checker | |
| 11.4.6 Checking Process Control Files | |
| 11.5 Compiling and Linking | |
| 11.5.1 Updating the Process Control File (PCF) | |
| 11.5.2 Compiling Status Message Facility (SMF) Files | |
| 11.5.3 Setting up a SDP Toolkit Environment | |
| 11.5.4 Compiling a PGE and Linking With SCF Version of SDP Toolkit | |
| 11.5.5 Compiling a PGE and Linking with DAAC Version of SDP Toolkit | |
| 11.6 Updating the PDPS Database and Data Server | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 11.6.1 Operational Metadata Population | |
| 11.6.2 Science Metadata Population | |
| 11.6.3 Inserting Science Software Archive Package into Data Server | |
| 11.6.4 Inserting Static Files into Data Server | |
| 11.6.5 Inserting Executables into Data Server | |
| 11.7 PGE Planning and Processing | |
| 11.7.1 Planning Workbench | |
| 11.7.2 Production Request Editor | |
| 11.7.3 Profiling a PGE Executable | |
| 11.8 File Comparison | |
| 11.8.1 Acquiring the Output Files | |
| 11.8.2 HDF File Comparison Using the GUI | |
| 11.8.3 HDF File Comparison Using hdiff | |
| 11.8.4 ASCII File Comparison | |
| 11.8.5 Binary File Comparison | |
| 11.8.6 Viewing Product-Created Metadata Using the EOSView Tool | |
| 11.9 Post-Production Activities | |
| 11.9.1 Viewing Granule and Data Dictionary Metadata | |
| 11.9.2 Science Software Problem Tracking | |
| 11.9.3 Science Software Defect Tracking | |
| 11.9.4 ECS Non-Conformance Reporting | |
| 11.10 Troubleshooting and General Investigation | |
| 11.10.1 Examining PGE-Produced Log Files | |
| 11.10.2 Examining the MSS Log File | |
| 11.10.3 Extracting Prologs from the Science Software Source Files | |
| 11.10.4 PDPS Prototype-Related Scripts and Message Files | |
| 11.11 Miscellaneous | |
| 11.11.1 Setting Up the Release A Newsgroups | |
| 11.11.2 Reading Release A Newsgroups | |
| 11.11.3 Posting to Release A Newsgroups | |
| 12. RESOURCE PLANNING | |
| 12.1 Create a Resource Reservation | |
| 12.2 Edit a Resource Request | |
| 12.3 Validate a Resource Reservation | |
| 12.4 Approve a Resource Reservation | |
| 12.5 View Resource Reservation Timeline | |
| 12.6 Activate Resource Reservation Plan | |
| 12.7 Cancel a Resource Reservation | |
| 13. PRODUCTION PLANNING | |
| 13.1 Create New Production Request | |
| 13.2 Edit/Modify Production Request | |
| 13.3 Review Data Production Requests | |
| 13.4 Create New Production Plan | |
| 13.5 Review Plan Timeline | |
| 13.6 Reports | |
| 13.6.1 Generate Standard Production Reports | |
| 13.6.2 Generate Custom Reports | |
| 14. PRODUCTION PROCESSING | |
| 14.1 Configure AutoSys | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 14.1.1 AutoSys Runtime Options | |
| 14.1.2 Configure Hardware Groups | |
| 14.2 Review Hardware Status | |
| 14.2.1 Review Hardware Status | |
| 14.2.2 Hardware Status View Options | |
| 14.3 Review DPR Dependencies | |
| 14.4 Review DPR Production Timeline | |
| 14.5 Modify Job Priority | |
| 14.6 Review Alarms | |
| 14.6.1 Review Alarms | |
| 14.6.2 Alarm Selection Configuration | |
| 14.7 Review Job Activities | |
| 14.7.1 Review Job Activities | |
| 14.7.2 Review Job Selection Criteria | |
| 14.8 Modify Job Status | |
| 14.9 Activity Log | |
| 14.10 Job Dependency Log | |
| 14.11 Defining Monitors/Browser | |
| 14.11.1 Defining Monitors/Browser | |
| 14.11.2 Monitor/Browser Reports | |
| 14.12 Database Maintenance Time Change | |
| 14.13 Time Synchronization | |
| 14.13.1 Time Synchronization Procedure | |
| 14.13.1.1 Time Synchronization Quick-Steps | |
| 14.14 Production Reports | |
| 15. QUALITY ASSURANCE | |
| 15.1 DAAC Product QA | |
| 15.2 Product QA Subscription | |
| 15.2.1 Product QA Subscription Procedures | |
| 15.2.1.1 Product QA Subscription Quick-Steps | |
| 15.3 DAAC Product QA | |
| 15.3.1 Perform DAAC Product QA Procedure | |
| 15.3.1.1 Perform DAAC Product QA Quick-Steps | |
| 15.2 EOSView | |
| 15.3 Product QA Documentation | |
| 15.5 Product QA Documentation | |
| 15.5.1 User Comment Document (Granule & Collection) Procedure | |
| 15.5.1.1 User Comment Document (Granule & Collection) - Quick-Steps | |
| 15.5.2 Validation Document (Collection) | |
| 15.5.3 Quality Text Document (Collection) | |
| 15.5.4 Quality Explanation (Granule & Collection) | |
| 15.5.5 Science Review Status (Granule & Collection) | |
| 15.6 Product QA Access Restraints | |
| 15.6.1 Product QA Access Restraints | |
| 15.6.1.1 Product QA Access Restraints - Quick Steps | |
| 15.7 QA Reports | |
| 15.7.1 QA Reports | |
| 15.7.1.1 QA Reports | |
| 16. INGEST | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 16.1 ECS Ingest Tool | |
| 16.1.1 View the Ingest History Log | |
| 16.1.2 Ingest History Log Reports | |
| 16.1.3 Ingest Monitor/Control | |
| 16.1.4 Ingest Operator Tools | |
| 16.1.4.1 Modify External Data Provider/Interactive User Information | |
| 16.1.4.2 Modify System Parameters | |
| 16.1.5 Media Ingest | |
| 16.2 Operator Tools | |
| 16.2.1 Modify External Data Provider/Interactive User Information | |
| 16.2.1.1 E-mail Address | |
| 16.2.1.2 Volume Threshold | |
| 16.2.1.3 Request Threshold | |
| 16.2.1.4 Priority Level | |
| 16.2.2 Modify System Parameters | |
| 16.2.2.1 Volume Threshold | |
| 16.2.2.2 Request Threshold | |
| 16.2.2.3 Communication Retry Count | |
| 16.2.2.4 Communication Retry Interval | |
| 16.2.2.5 Monitor Time | |
| 16.2.2.6 Screen Update Time | |
| 16.3 Ingest Processing | |
| 16.3.1 DAN Creation | |
| 16.3.2 Automated Network Ingest | |
| 16.3.2.1 Starting the Automated Network Ingest Server | |
| 16.3.2.2 Submitting a Data Availability Notice (DAN) | |
| 16.3.2.3 Monitoring User's Ingest Status | |
| 16.3.2.4 Viewing a Data Delivery Notice (DDN) | |
| 16.3.2.5 Recovery from a Faulty DAN | |
| 16.3.2.6 Recovery from a Data Ingest Failure | |
| 16.3.3 Polling Ingest with Delivery Record (DR) | |
| 16.3.3.1 Recovery from a Faulty DR | |
| 16.3.3.2 Recovery from Data Ingest Failure | |
| 16.3.4 Polling Ingest Without Delivery Record | |
| 16.3.4.1 Recovery from Data Ingest Failure | |
| 16.3.5 Hard Media Ingest | |
| 17. ARCHIVE | |
| 17.1 Storing New Data in Archive Repository | |
| 17.1.1 Recover from Failure to Store Data | |
| 17.2 Handling Archived Data | |
| 17.2.1 Backing Up Archive Data | |
| 17.2.2 Deleting Files from the Archive | |
| 17.2.3 Archive Data Recovery/Restoration | |
| 17.2.3.1 Use of Backup Data for Recovery | |
| 17.2.3.2 Requesting Replacement Data from Provider | |
| 17.3 Monitoring and Fault Notification | |
| 17.4 Temporary Data Storage of Intermediate Files | |
| 18. DATA DISTRIBUTION | |
| 18.1 Media Operations | |
| 18.1.1 Loading Tapes | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 18.1.2 Dismounting Tapes | |
| 18.1.3 Tape Fault | |
| 18.1.4 Creating Labels | |
| 18.2 Product Shipment | |
| 19. USER SERVICES | |
| 19.1 ECS User Account Management | |
| 19.1.1 Retrieve User Account/Validate a User | |
| 19.1.1.1 Retrieve User Account/Validate a User Quick-Steps | |
| 19.1.2 Create a User Account | |
| 19.1.2.1 Account Information | |
| 19.1.2.2 Personal Information | |
| 19.1.2.3 Shipping Address | |
| 19.1.2.4 Billing Address | |
| 19.1.2.5 Mailing Address | |
| 19.1.2.6 Create a User Account Quick-Steps | |
| 19.1.3 Account Creation From URL Registration | |
| 19.1.3.1 Account Creation From URL Registration Quick-Steps | |
| 19.1.4 Edit/Modify an Existing Account | |
| 19.1.4.1 Edit/Modify Account Information | |
| 19.1.4.2 Edit/Modify Personal Information | |
| 19.1.4.3 Edit/Modify Shipping Address | |
| 19.1.4.4 Edit/Modify Billing Address | |
| 19.1.4.5 Edit/Modify Mailing Address | |
| 19.1.4.6 Edit/Modify an Existing Account Quick-Steps | |
| 19.1.5 Deleting an ECS Account | |
| 19.1.5.1 Deleting ECS Account Quick-Steps | |
| 19.1.6 Canceling an ECS Account | |
| 19.1.6.1 Canceling an ECS Account Quick-Steps | |
| 19.1.7 Changing an ECS User's Password | |
| 19.1.7.1 Changing an ECS User's Password Quick-Steps | |
| 19.2 Processing an Order | |
| 19.2.1 Create a User Contact Log Record | |
| 19.2.1.1 How to Create a User Contact Log Record | |
| 19.2.1.1.1 Creating a User Contact Log - Quick-Steps | |
| 19.2.2 Retrieve User Information | |
| 19.2.2.1 Retrieve User Account Quick-Steps | |
| 19.2.3 Locate Data Via Search and Order Tool | |
| 19.2.3.1 Obtain a Spatial Summary | |
| 19.2.3.2 Obtain a Temporal Summary | |
| 19.2.3.3 Obtain a Discrete Attribute Summary | |
| 19.2.3.4 Browse the Search Results | |
| 19.2.3.5 Select Granules to Order | |
| 19.2.4 Request Price Estimate | |
| 19.2.5 Specify Order Details | |
| *19.2.5.3 Provide Billing & Accounting Information | |
| 19.2.5.4 Order Data Quick-Steps | |
| 19.2.6 Update User Contact Log | |
| 19.2.6.1 Update a User Contact Log Procedure | |
| 19.2.6.1.1 Update User Contact Log Record - Quick-Steps | |
| 19.3 Cancel an Order | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|--|-----------------------------------|
| 19.3.1 ECS Order Tracking | |
| 19.3.2 Cancel an Order Via DSS | |
| 19.3.2.1 Locate Order Via Request Tracking Tool | |
| 19.3.2.2 Cancel Order Via Science Data Server GUI | |
| 19.3.3 Update User Contact Log | |
| 19.3.4 Cancel an Order Quick-Steps | |
| 19.4 Fulfilling Subscriptions | |
| 19.4.1 Fulfilling a One-time Subscription | |
| 19.4.2 Fulfilling an Open Ended Subscription | |
| 19.4.3 Returning a List of Subscriptions | |
| 19.4.4 Canceling a Subscription | |
| 19.4.5 Fulfilling Subscriptions Quick-Steps | |
| 19.5 Creating/Logging a Trouble Ticket | |
| 19.6 Cross-DAAC Referral Process | |
| *19.7 Cross-DAAC Order Tracking | |
| 19.8 Guide Authoring and Maintenance | |
| 19.8.1 Creating Guide HTML Documents | |
| 19.8.2 Loading Guide Documents | |
| 19.8.3 Editing Guide Documents | |
| 20. LIBRARY ADMINISTRATION | |
| 20.1 SEO Document Maintenance | |
| 20.1.1 Authoring Documents | |
| 20.1.2 Formatting Documents | |
| 20.1.3 Importing Documents | |
| 20.1.4 Exporting Documents | |
| 20.1.5 Metadata Maintenance | |
| 20.2 On-Site Document Maintenance | |
| 20.2.1 Authoring Documents | |
| 20.2.2 Importing Documents | |
| 20.2.3 Formatting Documents | |
| 20.2.4 Searching for a Document | |
| 20.2.5 Metadata Maintenance | |
| 20.3 Preparing Documents for Insertion into the DDSRV | |
| 20.4 Maintenance of Document Inventory Records and Links to Configuration Items in Baseline Manager | |
| 20.5 Document Metadata Insertion Subscription | |
| 20.6 Document Repository Maintenance | |
| 20.7 Document Access Control | |
| 20.8 Retrieval of HTTP Formatted Documents | |
| 21. COTS HARDWARE MAINTENANCE | |
| 21.1 COTS Hardware Support - General | |
| 21.1.1 Corrective Maintenance | |
| 21.1.2 Preventive Maintenance | |
| 21.1.3 Configuration Management | |
| 21.1.4 COTS Hardware Support Safety | |
| 21.2 COTS Hardware Support - Contract Information | |
| 21.2.1 Management of COTS Hardware Support Contracts | |
| 21.2.2 Contract Maintenance Terms | |
| 21.2.3 COTS Hardware Database | |
| 21.3 Hardware Repairs - Standard | |
| 21.3.1 Hardware Problem Reporting | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 21.3.2 Initial Troubleshooting/Diagnostics | |
| 21.3.3 Hardware Corrective Maintenance Actions | |
| 21.3.4 Contract On-Site Hardware Support | |
| 21.3.5 Return-to-Depot Support | |
| 21.4 Maintenance Spares | |
| 21.4.1 Installed Maintenance Spares | |
| 21.4.2 Use of Maintenance Spares | |
| 21.4.3 Return of Failed LRUs | |
| 21.5 Non-standard Hardware Support | |
| 21.5.1 Escalation of COTS Hardware Support Problem | |
| 21.5.2 Time and Material (T&M) Hardware Support | |
| 22. SOFTWARE MAINTENANCE | |
| 22.1 COTS Software Maintenance | |
| 22.1.1 Management of COTS Software Maintenance Contracts | |
| 22.1.2 Management of COTS Software Licenses | |
| 22.1.3 COTS Software Installation | |
| 22.1.4 Obtaining COTS Software Support | |
| 22.1.4.1 COTS Software Problem Reporting | |
| 22.1.4.2 Troubleshooting COTS Software | |
| 22.1.4.3 Corrective Action Reporting | |
| 22.2 Custom Software Maintenance | |
| 22.2.1 Implementation of Modifications | |
| 22.2.2 Test Plans and Procedures | |
| 22.2.3 Custom Software Installation | |
| 22.2.3.1 Scheduling the Release | |
| 22.2.3.2 Operations and User Notification | |
| 22.2.3.3 Maintenance Changes to the On-Site SW Change Manager Library | |
| 22.2.3.3.1 Branching Approach | |
| 22.2.3.3.2 Configuring the Operational Environment | |
| 22.2.3.3.3 Performing Merge Activities | |
| 22.2.3.3.4 Configuration Specifications | |
| 22.2.3.3.5 Branch Naming Conventions | |
| 22.2.3.4 Creating the SW Build Using SW Change Manager (ClearCase) | |
| 22.2.3.5 Promoting Software Using SW Change Manager (ClearCase) | |
| 22.2.3.5.1 "Change State Script" Description | |
| 22.2.3.5.2 Promotion_level Script Description | |
| 22.2.3.6 Installing the New Release | |
| 22.2.4 Obtaining Software Support | |
| 22.2.4.1 SW Problem Reporting | |
| 22.2.4.2 Troubleshooting | |
| 22.2.4.3 Corrective Action Reporting | |
| 22.2.5 Science Software | |
| 23. PROPERTY MANAGEMENT | |
| 23.1 Receipt of Equipment and Software | |
| 23.2 Equipment Tagging | |
| 23.3 Property Records and Reporting | |
| 23.3.1 Maintaining Property Records | |
| 23.3.2 Property Reporting | |

| Mission Operations Procedures for the ECS Project | Test Procedure Paragraph # |
|---|-----------------------------------|
| 23.3.3 Reporting Loss, Theft, Damage or Destruction | |
| 23.3.4 Obtaining Relief from Accountability | |
| 23.4 Equipment Relocation | |
| 23.4.1 Intra-site Relocation | |
| 23.4.2 Inter-site Relocation | |
| 23.4.3 Relocation Off-site for Vendor Repairs | |
| 23.4.4 External Transfers | |
| 23.5 Inventories and Audits | |
| 23.6 Storage | |
| 23.6.1 Segregation Requirements | |
| 23.6.2 Stock Rotation | |
| 23.6.3 Physical Security | |
| 23.7 Packing and Shipping | |
| 24. INSTALLATION PLANNING | |
| 24.1 Responsibilities | |
| 24.2 Process Description | |
| 24.3 Maintenance of Facility and Network Diagrams | |
| 24.4 Maintenance of LAN Cable Management Schema | |
| 25. COTS TRAINING | |
| 25.1 Requesting COTS Training | |
| 25.2 Coordinating COTS Training | |
| 25.3 Canceling/Rescheduling COTS Training | |
| 25.4 Maintenance of COTS Training Records | |
| 25.5 Contractor COTS Training Funds Accounting | |
| 26. ON-LINE ADVERTISING SERVICE ADMINISTRATION | |
| 26.1 Accessing ESOD | |
| 26.2 ESOD Administration | |
| 26.2.1 Create a Moderation Group | |
| 26.2.2 Update a Moderation Group | |
| 26.2.3 Delete a Moderation Group | |
| 26.3 ESOD Moderation | |
| 26.4 On-line Advertising Service Configuration Files | |

This page intentionally left blank.

Appendix D. Test Sequences Mapped to GSFC Hardware

This table lists each piece of hardware at the Release A ECS GSFC DAAC in the left column, and in the right column a list of test procedures which use that hardware as part of the procedure(s).

(Note: This table was requested by GSFC DAAC. It will be filled in as the information becomes available)

Table D-1 Test Sequences Mapped to SMC Hardware

| Subsystem | HWC/C SCI | Platform | Custom Executables | COTS | Test Procedure Paragraph # |
|-----------|-----------|---|---|---|----------------------------|
| CSS | DHCI | CSS-SMC-1 (CSS server) and MSS-SMC-5 (MSS server) | DCE Directory, Security and Time servers, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, net.h++, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, mail server, Crack, Npassword, TCP Wrappers, Tripwire | |
| MSS | MSSHCI | MSS-SMC-5 (MSS server) and CSS-SMC-1 (CSS server) | MsAgDpty, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, net.h++, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape, Sybase server, essm, sqr wkbch, PNM, HPOV, Crack, Npassword, TCP Wrappers, Tripwire | |
| MSS | MSSHCI | MSS-SMC-1 | Clearcase server, peer agent, Inventory change manager (SoftPC/MS Office) | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase server and client, tools.h++, dbtools.h++, Remedy, tivoli client, wabi/office, netscape server (must be configured for DNS lookup), sybase client, Crack, Npassword, TCP Wrappers, Tripwire | |
| MSS | MSSHCI | MSS-SMC-3 (MSS WS) | GUI executables | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, Crack, Npassword, TCP Wrappers, Tripwire | |

| Subsystem | HWC/C SCI | Platform | Custom Executables | COTS | Test Procedure Paragraph # |
|-----------|--------------|--|--|---|-------------------------------|
| CSS | DCHI | CSS-SMC-2 (BB server) | Ingest operator GUI, peer agent | Op sys, snmp agent, dce, oodce, motif, x11r5, clearcase client, tools.h++, dbtools.h++, Remedy*, tivoli client, wabi/office, netscape browser, Bulletin Board (NNTP), Crack, Npassword, TCP Wrappers, Tripwire | |
| Client | DESKT | All operator workstations and servers (if xterms access servers) | EcsDesktop | ROGUEWAVE tools.h++ OODCE DCE C/C++ Doug Young's Library for Motiff/C++ 1992 Epak Widgets | |
| | | | | Motif Window Manager, mwm (Solaris or SunOS) or platform- dependent alternative: Vnewm (HP), 4Dwm (SGI), NCDs (NCDwm), etc. | |
| | | | | Web browser: Netscape | |
| | | | | DCE OODCE Motif or CDE with equivalent Motif version ICS Builder Xcessory ICS EPak widgets RogueWave tools.h++ C/C++ compilers and debuggers | |
| | | | | Doug Youngs's C++ library for Motif 1992 version ECS C++ widget wrapper library (TBD) | |
| Client | WKBCH | | User Registration Tool User Profile Tool | Same as Client | |

Appendix E Test Procedure Format

The following contain a test procedure template, with annotations describing what each item contains.

A.1 Scenario Test Group

Each Scenario Group begins with an overview paragraph describing the Scenario Group.

A.1.1 Scenario Title

Each Scenario begins with a paragraph summarizing the Scenario.

A.1.1.1 Sequence Title

Each Sequence has a brief summary describing this sequence of tests.

Configuration: The subsystems needed to perform this sequence of tests are listed here. Appendix D contains additional detail.

External Interfaces: The external interfaces (i.e. other ECS sites and data sources) needed for a sequence (both real and simulated) are listed.

Operator Position(s): The operator positions from the ECS Maintenance and Operations Position Descriptions document (607/OP2) needed to support a sequence are listed.

Operational Scenario(s): The operations scenarios, taken from the Operations Scenarios for the ECS Project: Release-A document (605/OP1), that were used to develop tests in this sequence of tests are listed.

Test Dependencies: This table identifies the test procedure(s) in a sequence of tests that should be run prior to or concurrently with a sequence or test procedure.

| Test Procedure No. | Site/Procedure No. | Comments |
|--------------------------------|--------------------|---------------------|
| Insert proc. # for this volume | List site/proc. # | Prior or Concurrent |

A.1.1.1.1 Procedure Title

| | | | | |
|---|---|--|--|--------------------------|
| TEST Procedure No.: A unique #, taken from the Acceptance Test Plan, used to identify the test in RTM | Date Executed: Filled in on the date the formal test is run | Test Conductor The test conductor for this site | | |
| Title: The title of the test | | | | |
| Objective: A brief statement of the objective of this procedure, taken from the ATP test case description. | | | | |
| Requirements | | Acceptance Criteria | | |
| Requirement i.d. from RTM (i.e. DADS1700#A) | | For each requirement verified in a procedure the acceptance criteria contains the following information in the order shown below: a. The Verification method (inspection, analysis, demonstration or test) b. The text of the requirement c. A brief description of HOW the requirement is verified in the test procedure. This description may specify certain functions that the system must perform, specifications or standards that must be complied with, or performance criteria (such as responses times or throughput) that must be met. | | |
| Test Inputs: For each procedure, specific test inputs are identified and listed in the table below | | | | |
| Data Set Name | Data Set ID | File Name | Description | Version |
| Descriptive name | data set identifier | name of the physical file containing the data | a brief description of what is in the file | A version control number |

| Step-By-Step Procedures | | |
|--|--|--|
| Step No. | Input Action / Expected Results | Pass / Fail / Comments |
| 10 | Contains a description of a particular input, or action to be taken by a tester or operator, OR an expected result from the system under test. | Brief explanation of why a step may have failed, or a deviation from the written procedures, and a reference to an NCR, if applicable. |
| 20 | | |
| 30 | | |
| etc. | | |
| Data Reduction and Analysis Steps: <p>This section describes the method used for data reduction and includes instructions necessary to complete the analysis of test results. If applicable, the XRunner and LoadRunner reports generated during script execution are also described in this section. A list of all test outputs that need to be secured after testing (i.e. screen dumps, system logs, etc.) is also included here.</p> | | |
| Signature: Witness or testers signature | | Date: Date the test is signed off |

This page intentionally left blank.

Abbreviations and Acronyms

| | |
|--------|---|
| ACMHW | Access and Control Management Hardware |
| ADC | Affiliated Data Center |
| ADSVR | Advertising Data Server |
| AI&T | Algorithm Integration and Test |
| AITHW | Algorithm Integration and Test Hardware |
| AM-1 | EOS AM Project (morning spacecraft series) |
| API | application programming interface |
| ARP | address resolution protocols |
| ASF | Alaska SAR Facility (DAAC) |
| ASTER | Advanced Spaceborne Thermal Emission and Reflection Radiometer (formerly ITIR) |
| ATC | Actual Time Command |
| ATP | Acceptance Test Plan |
| ATPR | Acceptance Test Procedures |
| ATT | Acceptance Test Team |
| AVHRR | Advanced Very High Resolution Radiometer |
| BER | bit error rate |
| BGP | boundary gateway protocol |
| CASE | Computer Aided Software Engineering |
| CAST | Computer Aided Software Test |
| CCR | Configuration Change Request |
| CCSDS | Consultative Committee for Space Data Systems |
| CDRL | Contract Data Requirements List |
| CERES | Clouds and Earth's Radiant Energy System |
| CIESIN | Consortium for International Earth Science Information Network |
| CIO | Contents Identifier Object |

| | |
|-------|---|
| CLS | Client Subsystem |
| CM | Configuration Management |
| cmi | continuous measurable improvement |
| CMO | Configuration Management Office |
| COTR | Contracting Officer's Technical Representative |
| COTS | Commercial Off-The-Shelf (hardware or software) |
| CSR | Consent to Ship Review |
| CSS | Communications Subsystem |
| CZCS | Coastal Zone Color Scanner |
| DAAC | Distributed Active Archive Center |
| DAS | Daily Activity Schedule |
| DBMS | Data Base Management System |
| DCN | Document Change Notice |
| DDICT | Data Dictionary |
| DDTS | Distributed Defect Tracking System |
| DDN | Data Delivery Notice |
| DDS | Data Document Server |
| DDIST | Data Distribution |
| DES | Data Encryption Standard |
| DHF | Data Handling Facility |
| DIPHW | Distribution and Ingest Peripheral Hardware |
| DID | Data Item Description |
| DIT | Data Ingest Technician |
| DIF | Data Interface Facility (EDOS); |
| DMGHW | Data Management Hardware Sytstem |
| DMS | Data Management System |
| DOF | Distributed Object Framework |
| DPS | Data Processing Subsystem |
| DSA | directory service agent |

| | |
|--------|--|
| DSN | Deep Space Network |
| DSS | Data Server Subsystem |
| EAS | ECS Advertising Service |
| Ecom | ECS Communications |
| ECS | EOSDIS Core System |
| EDC | EROS Data Center (DAAC) |
| EDF | ECS Development Facility |
| EDHS | ECS Data Handling System |
| EDOS | EOS Data and Operations System |
| ED-Net | EOSDIS Backbone Network |
| EDU | Exchange Data Unit |
| EGS | EOS Ground System |
| EMC | Enterprise Monitoring and Coordination |
| EOC | EOS Operations Center |
| EOS | Earth Observing System |
| EOSDIS | Earth Observing System Data and Information System |
| ERBE | Earth Radiation Budget Experiment |
| EROS | Earth Resources Observation System |
| ESDIS | Earth Science Data and Information System |
| ESN | ECS Science Network |
| ETS | EOSDIS Test System |
| F&PRS | Functional and Performance Requirement Specification |
| FCA | Functional Configuration Audits |
| FDF | Flight Dynamics Facility |
| FOS | Flight Operations System |
| FOT | Flight Operations Team |
| FTP | File Transfer Protocol |
| GATT | Government Acceptance Test Team |
| GCDIS | Global Change Data Information System |

| | |
|-------|---|
| GCMO | Global Change Master Directory |
| GDS | ground data system |
| GN | Ground Network |
| GPCP | Global Precipitation Climatology Project |
| GPI | GOES Precipitation Index |
| GSFC | Goddard Space Flight Center |
| GUI | Graphic User Interface |
| GV | TRMM Ground Verification |
| HTML | Hypet-Text Markup Language |
| I/O | Input/Output |
| I&T | Integration and Test |
| IATO | Independent Acceptance Test Organization |
| ICLHW | Ingest Client Hardware |
| ICMP | Internet Control Message Protocol |
| IDR | Incremental Design Review |
| IGS | International Ground Station |
| ILS | Integrated Logistics Support |
| IMS | Information Management System |
| INS | Ingest Subsystem |
| IOS | Interoperability Subsystem |
| IOT | Instrument Operations Team |
| IP | Internet Protocol |
| IR | Interim Release |
| IRD | Interface Requirements Document |
| ISCCP | International Satellite Cloud Climatology Project |
| ISS | Internetworking Subsystem |
| ISS | Information Subsystem |
| IST | Instrument Support Terminal |
| IV&V | Independent Verification and Validation |

| | |
|--------|--|
| JPL | Jet Propulsion Laboratory |
| L0–L4 | Level 0 through Level 4 data |
| L0R | Level 0 Reformatted |
| LPS | Landsat Processing System |
| L-7 | Landsat 7 |
| LAN | Local Area Network |
| LaRC | Langley Research Center |
| LIS | Lighting Imaging Sensor |
| LSM | Local System Management |
| LSM | Local Site Manager |
| LTIP | Long Term Instrument Plan |
| LTSP | Long Term Spacecraft Plan |
| LVOs | Label Value Objects |
| M&O | Maintenance and Operations |
| MAC | Medium Access Control |
| MDT | mean down time |
| MIB | Management Information Base |
| MIME | Multi-purpose Internet Mail Extension |
| MISR | Multi-Angle Imaging SpectroRadiometer |
| MITI | Ministry of International Trade and Industry (Japan) |
| MODIS | Moderate Resolution Imaging Spectrometer |
| MOPITT | Measurements of Pollution in the Troposphere |
| NA | Network Analysis |
| MSFC | Marshall Space Flight Center |
| MSS | Management Subsystem |
| MTBM | Mean-Time Between Maintenance |
| NAB | National Association of Broadcasters |
| NARA | National Archives and Records Administration |
| NASA | National Aeronautics and Space Administration |

| | |
|--------|---|
| NASCOM | NASA Communications |
| NCC | Network Communication Center |
| NCDC | National Climatic Data Center |
| NCR | Non Conformance Report |
| NGDC | National Geophysical Data Center |
| NIST | National Institute for Standards and Technology |
| NLDN | National Lightning Detection Network |
| NMC | National Meteorological Center (NOAA) |
| NOAA | National Oceanic and Atmospheric Administration |
| NODC | National Oceanic Data Center |
| NOLAN | Nascom Operational Local Area Network |
| NRCA | Nonconformance Reporting and Corrective Action |
| NSI | NASA Science Internet |
| NSIDC | National Snow and Ice Data Center |
| OA | Office Automation |
| ODC | Other Data Center |
| ODFs | Operational Data Files |
| OJT | On-the-Job Training |
| ORNL | Oak Ridge National Laboratory |
| OSI | Open Systems Interconnection |
| OSPF | Open Shortest Path First (routing protocol) |
| OTD | Optical Transient Detector |
| PA | Product Assurance |
| PCAs | Physical Configuration Audits |
| PDPS | Product Development and Processing System |
| PDR | Preliminary Design Review |
| PDS | Production Data Set |
| PIs | Principal Investigators |
| PLS | Planning Subsystem |

| | |
|-------|--|
| PLNHW | Planning Hardware |
| PM | Performance Manager |
| PR | Precipitation Radar |
| QA | Quality Assurance |
| QO | Quality Office |
| RIO | Reference Identifier Object |
| RIP | Routing Information Protocol (207) |
| RM | Resource Manager |
| RMA | Reliability, Maintainability, Availability |
| RRR | Release Readiness Review |
| RTM | Requirements & Traceability Management |
| S/C | spacecraft |
| SA | System Administrator |
| SAA | Satellite Active Archive |
| SAGE | Stratospheric Aerosol and Gas Experiment |
| SAR | Synthetic Aperture Radar |
| SCC | Spacecraft Computer |
| SCF | Science Computing Facility |
| SDL | Software Development Library |
| SDPF | Sensor Data Processing Facility |
| SDPS | Science Data Processing Segment |
| SDR | System Design Review |
| SDSVR | Science Data Server |
| SI&T | System Integration and Test Organization |
| SMC | System Management Center |
| SME | Subject Matter Expert |
| SMMR | Scanning Multichannel Microwave Radiometer |
| SMPTE | Society of Motion Picture & Television Engineers |
| SMS | Systems Management Subsystem |

| | |
|-------|---|
| SNMP | Simple Network Management Protocol |
| SORR | Segment Operational Readiness Review |
| SPRHW | Science Processing Hardware |
| SSITT | Science Software Integration and Test Team |
| SSM/I | Special Sensor Microwave/Imager |
| SSR | Solid State Recorder |
| SUT | System Under Test |
| SW | Software |
| SWE | Snow Water Equivalent |
| TB | tera-byte |
| TDRSS | Tracking and Data Relay Satellite System |
| TMI | TRMM Microwave Imager |
| TOMS | Total Ozone Mapping Spectrometer |
| TOO | Target of Opportunity |
| TOVS | Television Infrared Observing Satellite (TIOS) Operational Vertical Sounder |
| TRMM | Tropical Rainfall Measurement Mission |
| TRR | Test Readiness Review |
| TSDIS | TRMM Science Data and Information Systems |
| TSL | Test Script Language |
| TSS | TDRSS Service Session |
| UR | Universal Reference |
| V0 | Version 0 |
| VIRS | Visible Infrared Scanner |
| WAN | Wide Area Network |
| WOTS | Wallops Orbital Tracking Station |

Glossary

| | |
|--------------------|---|
| Analysis | Technical or mathematical evaluation based on calculation, interpolation, or other analytical methods. Analysis involves the processing of accumulated data obtained from other verification methods. |
| Consent to Ship | Review to determine the readiness of a release for transition sites Review (CSR) for integration testing. |
| Critical Design | A detailed review of the element/segment-level design, including Review (CDR) such details as Program Design Language (PDL) for key software modules, and element interfaces associated with a release. |
| Demonstration | Observation of the functional operation of the verification item in a controlled environment to yield qualitative results without the use of elaborate instrumentation or special test equipment. |
| Incremental Design | Review conducted to evaluate segment designs associated with a Review (IDR) release. |
| Inspection | The visual, manual examination of the verification item and comparison to the applicable requirement or other compliance documentation, such as engineering drawings. |
| Scenario Group | A collection of scenarios that form one of the broadest functional subdivisions of the system. |
| Scenario | A functional subdivision of a Scenario Group which is designed and executed independently. |
| Sequence | A subdivision of a scenario which is designed to verify a number of functionally related requirements |
| Release Readiness | Conducted at the ECS system level for a GSFC Project Review Review (RRR) Team upon completion of release acceptance testing. The IATO leads the RRR to determine, with the GATT and the COTR, if the release is ready to be delivered, installed, and incorporated into the operational system. |
| Test | A procedure or action taken to determine under real or simulated conditions the capabilities, limitations, characteristics, effectiveness, reliability, or suitability of a material device, system, or method. |
| Test Case | A relatively small grouping of requirements that form the building blocks of a sequence. |
| Test Procedure | A detailed, step-by-step test of a logically related group of requirements |